

CANADIAN GEOGRAPHICAL JOURNAL

MARCH
1944

VOL. XXVIII
No. 3



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CANADIAN GEOGRAPHICAL JOURNAL

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Editor

—

Gordon M. Dallyn

This magazine is dedicated to the interpretation, in authentic and popular form, with extensive illustrations, of geography in its widest sense, first of Canada, then of the rest of the British Commonwealth, and other parts of the world in which Canada has special interest.

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The articles in this Journal are indexed in the *Reader's Guide to Periodical Literature* and the *Canadian Periodical Index* which may be found in any public library.

The British standard of spelling is adopted substantially as used by the Dominion Government and taught in most Canadian schools, the precise authority being the Oxford Dictionary as edited in 1936.

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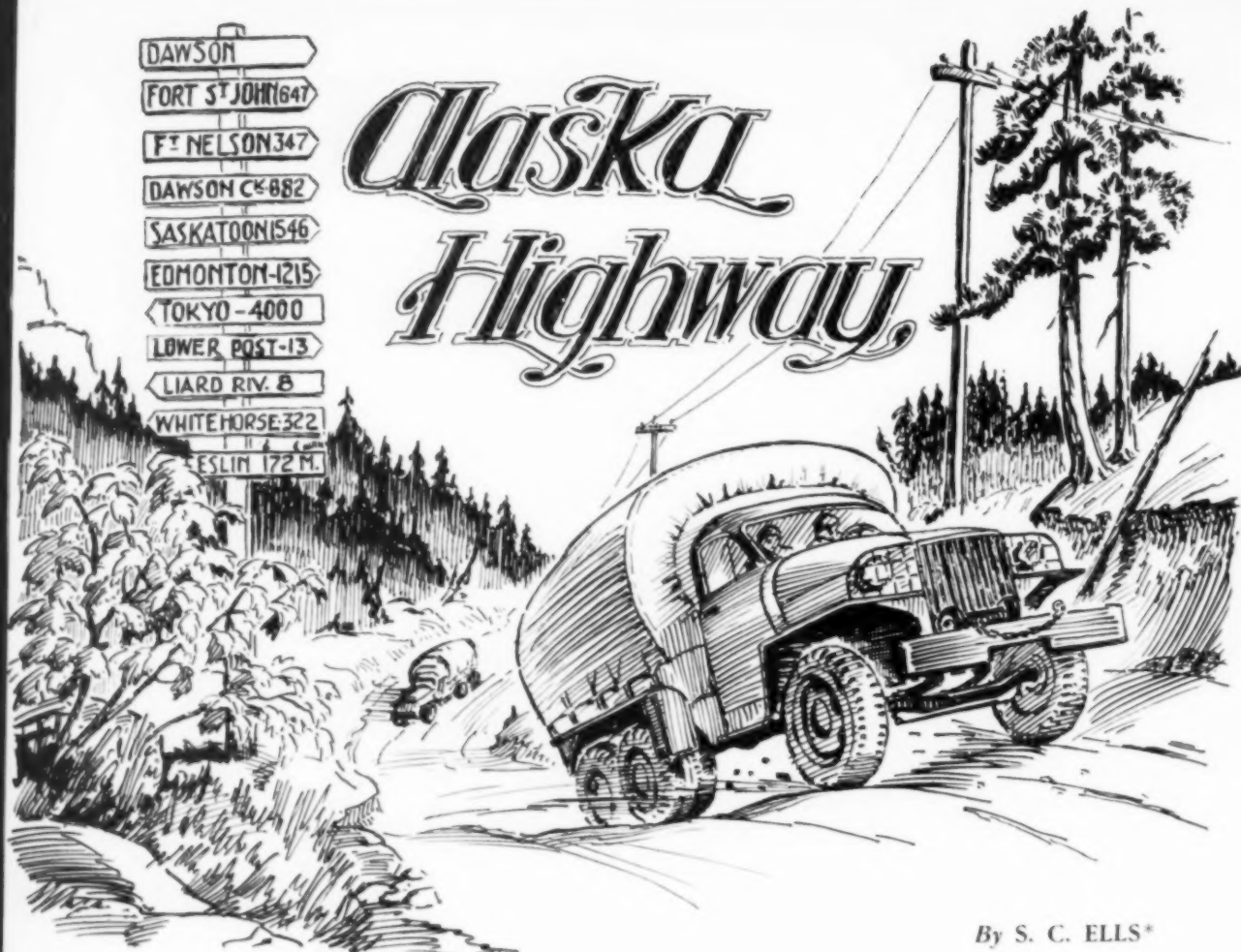
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By S. C. ELLS*

In 20 B. C., a glittering Golden Mile Post was erected in the Roman Forum—cross-roads of the Roman world. On this mile post were inscribed mileages to the four corners of the Roman Empire. In 1943 A. D., another mile post was erected on the frontier of another Empire—the Empire of the North!

Faint trails through lofty pass and empty plains,
The foaming trails of ancient prow and keel,
Charted the course of teeming ocean lanes,
The rushing splendour of the roads of steel;
Oh, wilderness of mountain, plain and stream!
Our northern empire sweeps from sea to sea,
A mighty giant stirs from age-old dream . . .
And o'er uncharted trails broods destiny!

Our dauntless fathers won the southern land,
Their rutted trails have sired the broad highway,
Now, east and west the busy cities stand,
Crowning the faith and hope of yesterday;
But northward highways fade . . . and trails grow dim
The crowding years spread yet another page,
From empty north beyond horizons rim
Comes challenge of our northern heritage!

"Our Heritage" from *Northland Trails*

IN 1746, a Russian peasant—Mikhail Novodchikov—discovered the Aleutian Islands. In December, 1941, Japanese forces struck at Pearl Harbour. Events which transpired in the North Pacific during the intervening years were destined to vitally affect the trend of world history and the future of civilization itself.

During the twenty years which followed the discovery by Novodchikov, small and ill-equipped Russian sailing boats ventured farther and farther to the eastward along

the Aleutian chain—bleak, craggy islands of almost terrifying newness, shrouded by the gloom of rain and fog which blanketed the restless slate-grey seas. Those crews which survived the desperate perils of saw-toothed reefs, screaming gales, disease, starvation and hostile natives, returned to the Siberian mainland with fabulous cargoes of sea otter and other furs.

By 1785, hardy Russian traders had reached the mainland of Alaska—then known only as the "Northwest Coast". By

*Illustrations by the author

1802, largely through the efforts and indomitable courage of Aleksandr Andreovich Baranov, "Lord of Alaska" and Governor of the Russian-American Company, a chain of fortified trading posts had been established as far south as California, and Company Consulates, organized in the Phillipines, Burma, and elsewhere. Finally, after long delay, the North Pacific was officially recognized as Russian domain by the Tzar Paul. At long last it was recognized that control of Alaska might well mean control of the Pacific.

With the death of Baranov in 1819, the appointment of successors who—with the notable exception of Baron Von Wrangell—were unqualified to administer the affairs of the Russian-American Company, and indifference on the part of the Russian Government itself marked the beginning of the end of Russia's active interest in the North Pacific. On October 9, 1867, the Russian flag at Sitka was hauled down; in its place fluttered the Stars and Stripes. Alaska—embracing an area of more than half a million square miles—became a Territory of the United States of America. The price paid to Russia for "Seward's Folly" was \$7.2 million; the amount of trade subsequently developed already exceeds \$5 billion.

But the United States had not only assumed responsibility for the development and administration of potentially important natural resources; it had also assumed responsibility for the protection of one of the world's most strategically important areas.⁽¹⁾ Long before 1941, this responsibility had been recognized by military and naval authorities of the Republic, and, in the face of not a little adverse criticism, more than \$50 million had been expended on military and naval installations and on air bases. In December, 1941, the full implications of responsibilities assumed in 1867 became apparent. Fortunately, the continuance of the mighty drama visualized by Baranov was in safe hands.

Meanwhile, with the passing years, previous conceptions of continental and world travel routes were being re-orientated as a result of advances in the use and safeguarding of air transportation across

high latitudes. It was recognized that the shortest route between New York and Cairo is by way of Belle Isle Straits; that the shortest route from Seattle to Tokyo passes near Dutch Harbour. In war strategy, air routes had become a vital supplement to sea-lanes.

As early as 1920, Canadian airmen had commenced a study of airmail routes to the upper Liard and Yukon. By 1936, the advantages of the Edmonton-Whitehorse route had been confirmed; by 1939, selection and surveying of airport sites at strategic points had been completed. Early in 1941, contracts were let for the construction of airports at Grand Prairie, Fort St. John, Fort Nelson, Watson Lake and Whitehorse; at the close of the same year—when the United States entered the war—an airway, with necessary airports and radio ranges, was available between Edmonton and Fairbanks.⁽²⁾

Implications of the tragic phrase 'too little and too late' were now well understood. It was recognized that only a serviceable highway could ensure the efficient operation of the vital chain of Canadian airports built in 1941; airports which were to ensure the passage of sorely needed bombers for the Russian front during the black days which culminated at Stalingrad; of American and Canadian squadrons at a time when the western Aleutians were still held by an aggressive enemy.⁽³⁾ With hostile submarines already threatening Alaska's life-line—the sea route from the South,—only an overland route remote from the Pacific Coast could ensure the safe transport of men, equipment and gasoline to the most strategic area on the continent. Military strategy dictated the construction of the Alaska Highway. Moreover, such construction could, if necessary, release sorely needed coastal shipping for other vital routes in various parts of the world. Primarily, however, the servicing of a chain of established airports, emergency landing fields and landing strips, was a deciding consideration in the location of the highway.

The suggestion to construct a transportation connection between Alaska and established transportation systems of British Columbia, Alberta and the United

(1) Diamond, Anthony J.: "The Strategic Value of Alaska", *The Military Engineer*, January-February, 1941

(2) Wilson, J. A.: "North West Passage by Air", *Canadian Geographical Journal*, March, 1943

(3) If necessary, bombers can fly non-stop from Fort St. John to Alaska, but fighter planes require refuelling bases en route.

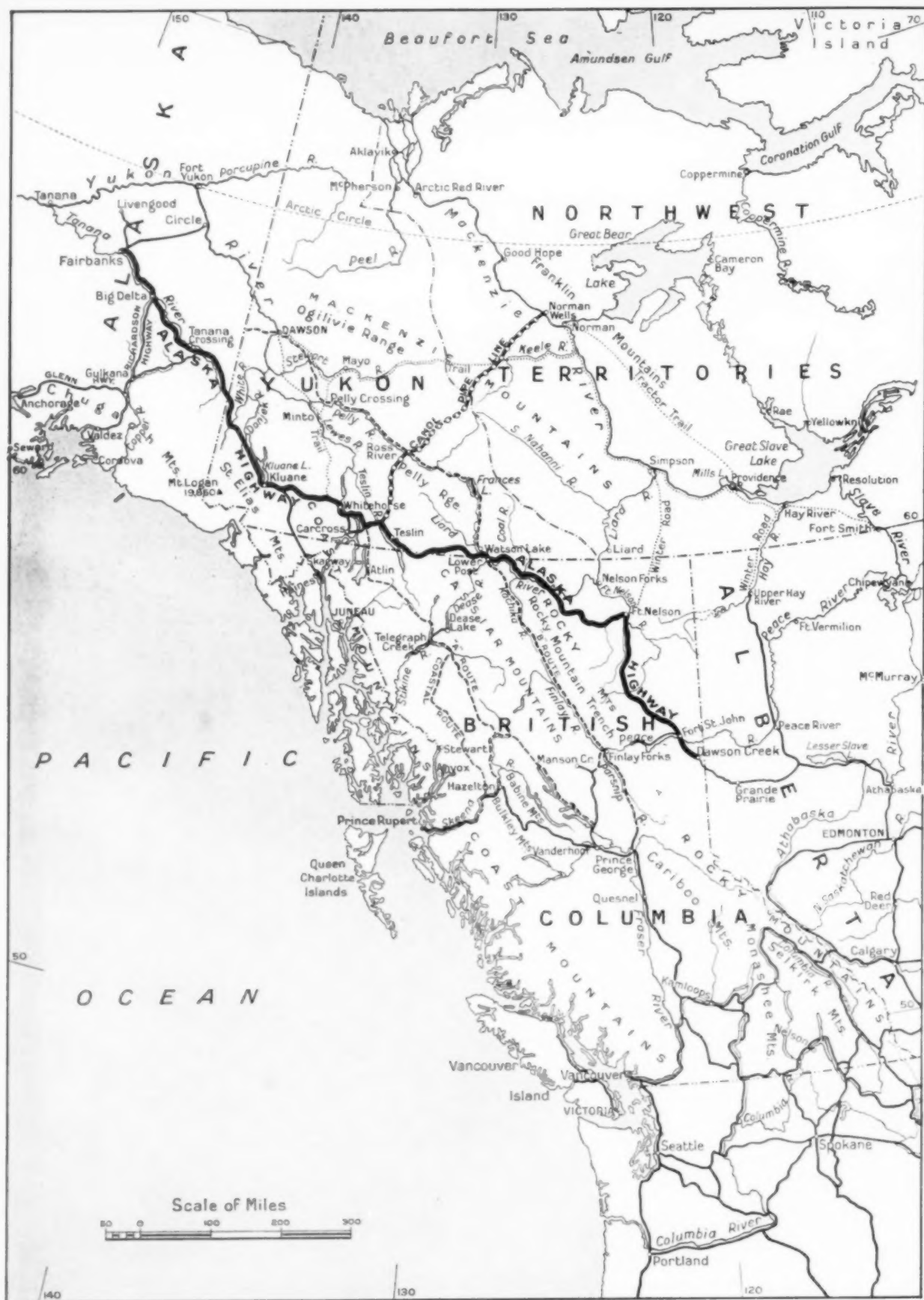


Hannibal crosses the Alps—218 B. C.

In 218 B. C., with an expeditionary force—including elephants, Hannibal marched from the south of Spain to northern Italy, a distance of approximately 1,300 miles, in five months. In crossing the Alps, 20,000 men of his army of 46,000 were lost.



United States troops crossing the Rocky Mountains—1943 A. D.
In 1943 A. D., United States troops were transported from Dawson Creek to Whitehorse, a distance of 939 miles, in 44 hours.



States was not a new one (4). In 1865, the Western Union Telegraph Company commenced construction of a telegraph line between the United States and Siberia. The route selected extended northward from Hazelton toward Telegraph Creek, and a considerable part of the "A" route investigated by the Alaska Highway Commission followed the general location of the old Telegraph Trail. The project was, however, abandoned following the successful completion of the transatlantic cable in 1869. In 1928, Donald MacDonald suggested the construction of a highway to Alaska, and, in 1929, support was given to the proposal by various public bodies on the Pacific Coast. In 1930, the project was given official recognition by the United States Congress and by the Canadian Government, and, in 1931, the International Fact Finding Committee was appointed. In 1933, this Committee completed its work, its report being based in part on reconnaissance surveys made by J. M. Ralston and J. H. Gray. The British Columbia-Yukon-Alaska Highway Commission (Canada) was established by Order in Council in 1938, and, in connection with the work of this Commission, reconnaissance surveys were made by Messrs. T. E. Clarke, L. Keith, E. C. W. Lamarque, R. M. Martin, J. H. Mitchell, and P. M. Monckton.

Obviously, the possible economic advantages of a highway to Alaska had long been recognized; from a military standpoint, its construction merely followed strategy established long before the Christian era. In war, victory has always rested with the leader who brings decisive force to bear at the decisive place and at the decisive time. Consequently, since very early times, the movement of men, equipment and supplies—whether by man power, by draft and pack animals, by truck, by aeroplane or by ships—has constituted an integral and increasingly vital factor in all military operations. To-day, roads are as much instruments of war as are guns and planes. For, through the long centuries,

primary objectives of war—to kill and to destroy—have remained the same; only methods have changed, efficiency increased.

Prior to the Christian era, thousands of miles of military highways radiated from the Golden Mile Post (5) in the Roman Forum to all centres of the Empire. Incidentally, a somewhat striking analogy may be drawn between the road system of the Roman Empire and the Alaska Highway and subsidiary connections. In general, construction of Roman roads followed rather than preceded conquests, the primary objective being rather to maintain control of wholly or partially conquered lands over a system of relatively rapid communications (6). Similarly, the primary objective in building the Alaska Highway was to protect and hold territory already acquired. Moreover, the Roman road system—with its many "feeder" roads—had a potent influence in the development of natural resources. Thus in Spain, Rome's oldest province in the West, the three trunk roads through the interior, the coastal roads and the "feeders" brought unprecedented development (7) and prosperity. Development of industries and increased production from the soil followed road construction in the coastal lands of the Mediterranean and provided abundance for all in ancient Gaul and Greece, in Syria, in Egypt and in North Africa. Similarly, there are indications that construction of the Alaska Highway, and subsequently of "feeder" roads, together with more general use of aeroplanes, may encourage mineral production, other forms of useful activity and also tourist travel.

During the past eighteen months, articles in the Press and in various periodicals have given not a little publicity to the Alaska Highway. Certain of these articles were, however, written while construction was still in progress and, consequently, in some instances, have presented conflicting views. Uncertainty may therefore exist as to the actual present status of this outstanding example of highway engineering.

(4) Wardle, J. M.: "The Alaska Highway", *Journal of the Engineering Institute of Canada*, March, 1942

"Report on Proposed Highway through British Columbia and the Yukon Territory to Alaska", British Columbia-Yukon-Alaska Highway Commission, Canada, August, 1941

McMillan, Major Shelby A.: "The Strategic Route to Alaska", *The Military Engineer*, November, 1942

Sturdevant, Brig.-Gen. C. L.: "The Military Road to Alaska", *The Military Engineer*, April, 1943

(5) Erected in 20 B.C.

(6) During the first century of the Christian era, travel within the so-called civilized world attained a greater degree of speed and safety than during any succeeding period prior to the advent of steam in the nineteenth century.

(7) Gold, tin, iron, silver, copper and lead were among the minerals developed adjacent to "feeder" roads. At one time, in Spain, the silver mines alone employed 40,000 men.

The Agreement, which serves as a legal basis for the construction of the Alaska Highway, is dated March 17, 1942. It is of interest to note that long years of friendship and mutual understanding between the United States and Canada reduced discussions to a minimum and largely eliminated controversy. Under the Agreement, the United States agreed to construct a military highway between Dawson Creek and Fairbanks via Big Delta on the Richardson Highway and to pay all construction costs. The United States also assumed responsibility for maintenance of the highway for a period of six months after the war, at which time it would become the property of Canada. On their part, Canadian authorities—Dominion and Provincial—provided necessary rights-of-way, allowed free use of such construction materials as might be locally available, waived import duties, licence fees and income taxes on contractors and employees of United States citizenship, and co-operated in every way to facilitate progress of the work.

General supervision of the Alaska Highway—America's Burma road—was placed under Major-General Eugene Reybold, Chief of Engineers, with Brigadier-General C. L. Sturdevant, Assistant Chief of Engineers, in direct charge. Under Brigadier-General William Hoge, supervising field headquarters were established at Fort St. John and Whitehorse. Subsequently, responsible control of the southern sector—approximately one-half of the whole route—was assigned to Brigadier-General James A. O'Connor, while Brigadier-General Hoge retained control of the northern sector. Still later, on September 4, 1942, the North West Service Command was established under Brigadier-General O'Connor to supervise highway and railway construction and to supply maintenance services in Western Canada and Alaska.

As early as February, 1942, reconnaissance parties were in the field and shortly afterward more detailed surveys were undertaken. Owing to the nature of the terrain and—more particularly between Fort St. John and Fort Nelson—to dense forest growth, progress of location

surveys at the rate of approximately one mile per day proved inadequate, and the Ontario Government volunteered to demonstrate a rapid and efficient aerial-surveying method which had been developed by provincial engineers over a period of years. (8) On the acceptance of this offer by United States Army officers, Messrs. R. N. Johnston and K. H. Siddall were assigned to the southern sector of the highway, namely, that part of the route between Fort St. John and Watson Lake. Their subsequent co-operation in connection with the preparation of a detailed office location along not less than two-thirds of the southern sector, and also in demonstrating a procedure which had proved successful under similar conditions elsewhere, was of material assistance in accelerating progress of final location.

In Canadian territory, decisions with respect to the general route, as finally adopted, were dictated by locations of airports north of Dawson Creek. (9)

Fortunately, it was possible to commence construction at a number of points, namely, at Big Delta—a point on the Richardson Highway 94 miles south of Fairbanks, and at Whitehorse, Carcross, Morley Bay, Watson Lake, Fort Nelson, Fort St. John and Dawson Creek. The 35th Engineer Regiment began arriving at Dawson Creek on March 10th and was followed about May 1st by the 341st and about June 1st by the 95th (coloured). The 18th Engineer Regiment reached Whitehorse on April 29th via Skagway, while the 97th (coloured) worked south from Alaska. The 93rd (coloured) and the 340th, were based on Carcross and on Morley Bay on Teslin Lake. Equipment of each of the above regiments included twenty D-8 diesel tractors and bulldozers; twenty-four D-4 and R-4 tractors with bulldozers, and trailers for their transportation; three motor patrols; from fifty to ninety dump trucks; various cargo trucks; eleven to twenty ¼-ton trucks (jeeps); twelve pick-up trucks; two ½-yard gas shovels; one truck crane; six 12-cu. yd. carry-alls; six tractor-drawn graders; one portable sawmill and two pile drivers. In addition, each regiment carried the normal

(8) Johnston, R. N.: "Speeding up the Alaska Highway by Aerial-Survey Methods", *Roads and Bridges*, November, 1942.

(9) In addition to a chain of fully equipped airports, a number of flight strips are being constructed by the United States Army immediately adjacent to the highway. A series of emergency landing fields are being constructed by the Canadian Department of Transport. Gasoline pipe-lines also connect Skagway with Whitehorse, Fairbanks, Teslin Crossing, Carcross and Watson Lake. A pipe-line—577 miles in length—for delivery of crude oil is under construction between Norman Wells on the Mackenzie River and Norman Wells Junction at mile 836 on the highway.

assortment of small tools, water-purification equipment and electric lighting plants. Each Company was provided with a radio receiving and sending set mounted on a jeep. (10)

Second only to the necessity for speedy construction were the many problems presented by a country—in part unexplored and, except for the airways, lacking in transportation facilities for many hundreds of miles. But here cheerful enthusiasm and determination proved invaluable assets. In mud and dust, in tropical heat and arctic cold, in swirling snow and driving rain, tormented by myriads of insects, men from the four corners of the American Union—and from the Canadian Provinces as well—faced hardship and discomfort on wide muskegs, in the endless forests of the North and in the gorges of foaming torrents and great rivers. Along the northern sections of the route, permanently frozen grounds and glacial rivers presented new and difficult construction problems. High wages (11) and long working hours were the rule; operators of mechanized equipment relieved each other at the controls; the motors were seldom silent. When spring thaws transformed muskegs into quaking bogs, and streams were jammed with heaving masses of grinding, broken ice, aeroplanes were requisitioned to freight machines, supplies and food.

The general plan of construction was two-fold. Engineer troops of the United States Army were instructed to build a pioneer road "in the shortest possible time . . . and to a standard sufficient only for the supply of troops engaged on the work". The grade of the pioneer road as originally constructed, was from 18 to 24 feet wide and was completed in November, 1942. Subsequently, in 1943, United States Engineer troops, and contractors (12) selected by the Public Roads Administration, carried out improvements with respect to grades, alignment and gravelling, thus bringing the road up to its present standard. Truck convoys were, however, operated over the road during the greater part of the period of revision and reconstruction.

To outline steps taken in connection

with actual construction would constitute a review of the science of road building as developed in North America during the past thirty years. Upwards of 7,000 pieces of equipment including the finest and most powerful road-building machines—eventually formed an almost unbroken chain between Dawson Creek and Big Delta. Personnel of the seven Engineer Regiments aggregated approximately 9,000 men and, at the peak of construction, some 12,000 civilian workers were also employed. All possible steps were taken to ensure their comfort, health and safety.

Adequate finances were also available, and, as of December, 1943, expenditures had exceeded \$100 million. But the menace of enemy aggression in the North Pacific—with all its sinister implications—had been met by the United States Corps of Engineers. Once more the Corps had been true to its motto, "We will try; we will dare". Nevertheless, while paying tribute to those who were responsible for the construction of the Alaska Highway, recognition must also be given to the men who undertook early exploration of the Canadian section of the Pacific North West. These men included Hudson's Bay Company officials and traders, such as Robert Campbell, and explorers and geologists of the Dominion Government, such as Ogilvie, Dawson, McConnell, Camsell, and Keele. Often completely cut off from civilization for long periods, they laid the foundations of our knowledge of the northern areas under conditions much more arduous and hazardous than any encountered during the construction of the highway.

With the exception of the section between Kluane Lake and the Alaska boundary—which could be used only when the ground was frozen—the pioneer road was passable within eight months after construction was commenced. The Alaska Military Highway proper, 1,523 miles in length, was not completed until the end of November, 1943, and, at that time one or two major bridges were still under construction. (13) Nevertheless, the project must be regarded as one of the most notable road-construction undertakings of

(10) Sturdevant, Brig.-Gen. C. L.: "The Alaska Military Highway", *Journal of the Engineering Institute of Canada*, March, 1943

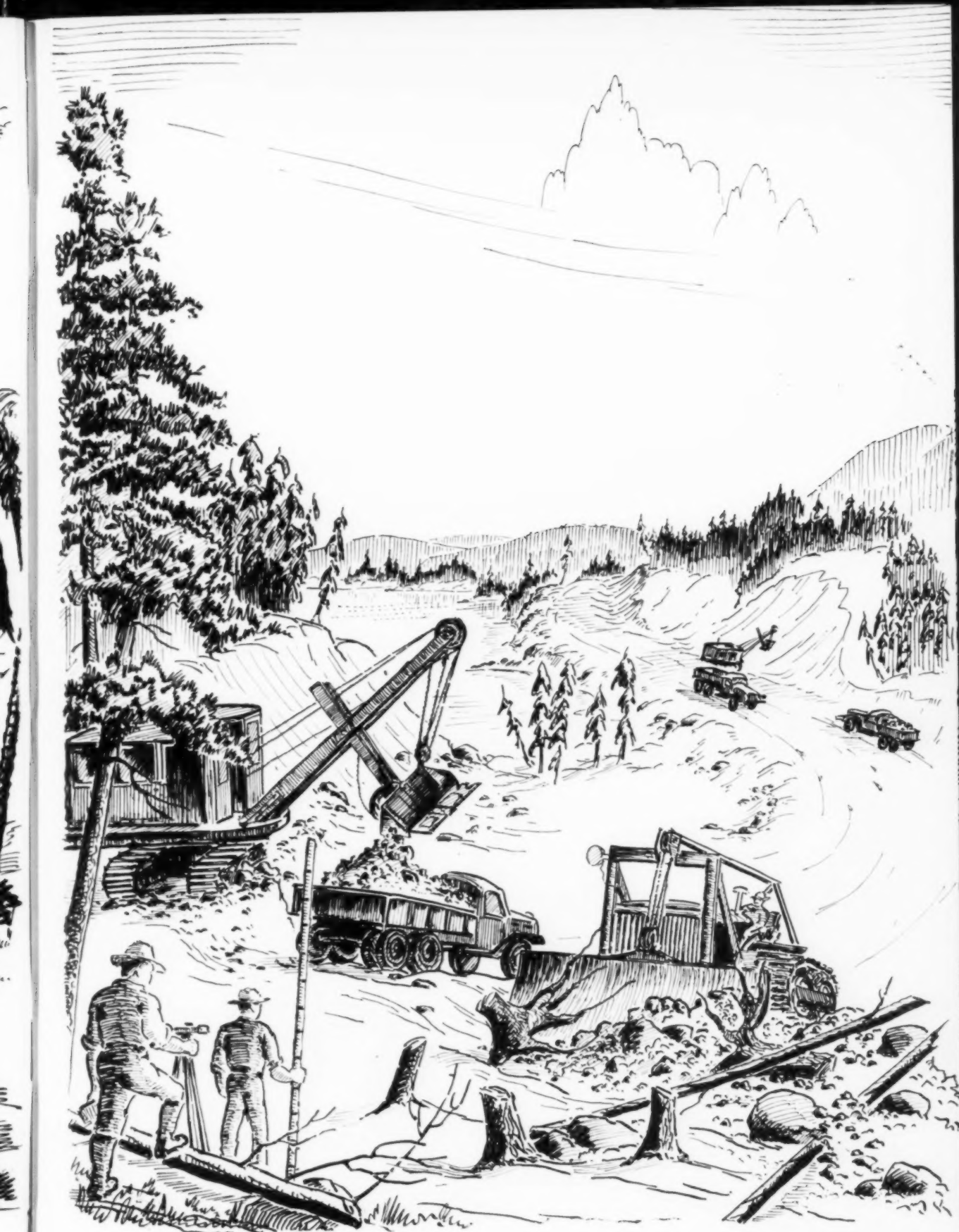
(11) Wages ranged from a minimum of 95 cents to \$2 per hour for American civilians. Wages of Canadian civilians were somewhat lower.

(12) Contracting organizations numbered 77. Of these, 62 were American and 15 Canadian.

(13) There are in all approximately 700 bridges along the Alaska Highway. The principal bridges are at crossings of the Peace and Liard Rivers.



Many thousands of miles of military highways were constructed by Romans by means of hand labour.



In the construction of the Alaska Highway mechanical appliances were used to a maximum possible extent and personnel employed reduced to a minimum.

all time. For a distance of approximately 55 miles north of Dawson Creek the finished grade has a width of 36 feet and construction is of a high type. Leading into Whitehorse from the south, a 4-mile section was built to an average width of 30 feet in view of concentrated traffic at that point. With the exception of the above two sections, however, the standard adopted for main road construction in 1943 was a 26-foot width of grade.

The first Greyhound bus operated over the highway reached Whitehorse in December, 1942, and prior to November, 1943, the largest type of buses—under lease from the Greyhound Corporation—were operating on regular schedules between Dawson Creek and Whitehorse. Elapsed time between these two points was as little as 44 hours. Smaller buses were employed for local traffic. In September, 6,500 passengers in all were transported approximately 2.2 million passenger miles. In November, 1943, a daily service was extended to Fairbanks. Each vehicle carries two drivers, and divisional points are established at Fort Nelson, Watson Lake, Whitehorse, and Northway. (14) In general, travel is restricted to military and construction personnel, but special permits may be issued to others having legitimate business along the highway. All traffic is controlled by United States officials.

It is of interest to note that the Burma road—the old caravan route known as early as the thirteenth century as the "Tribute Road"—is but 720 miles in length between Kunming and Lashio. On the other hand, this road, which ranks with the building of the Great Wall of China as a really great engineering feat, crosses a series of snow-capped mountain ranges at elevations up to 8,500 feet, and dips dizzily for thousands of feet into precipitous gorges to cross turbulent streams swollen to many times their normal flow during the monsoon period. Complete revision and reconstruction, under the

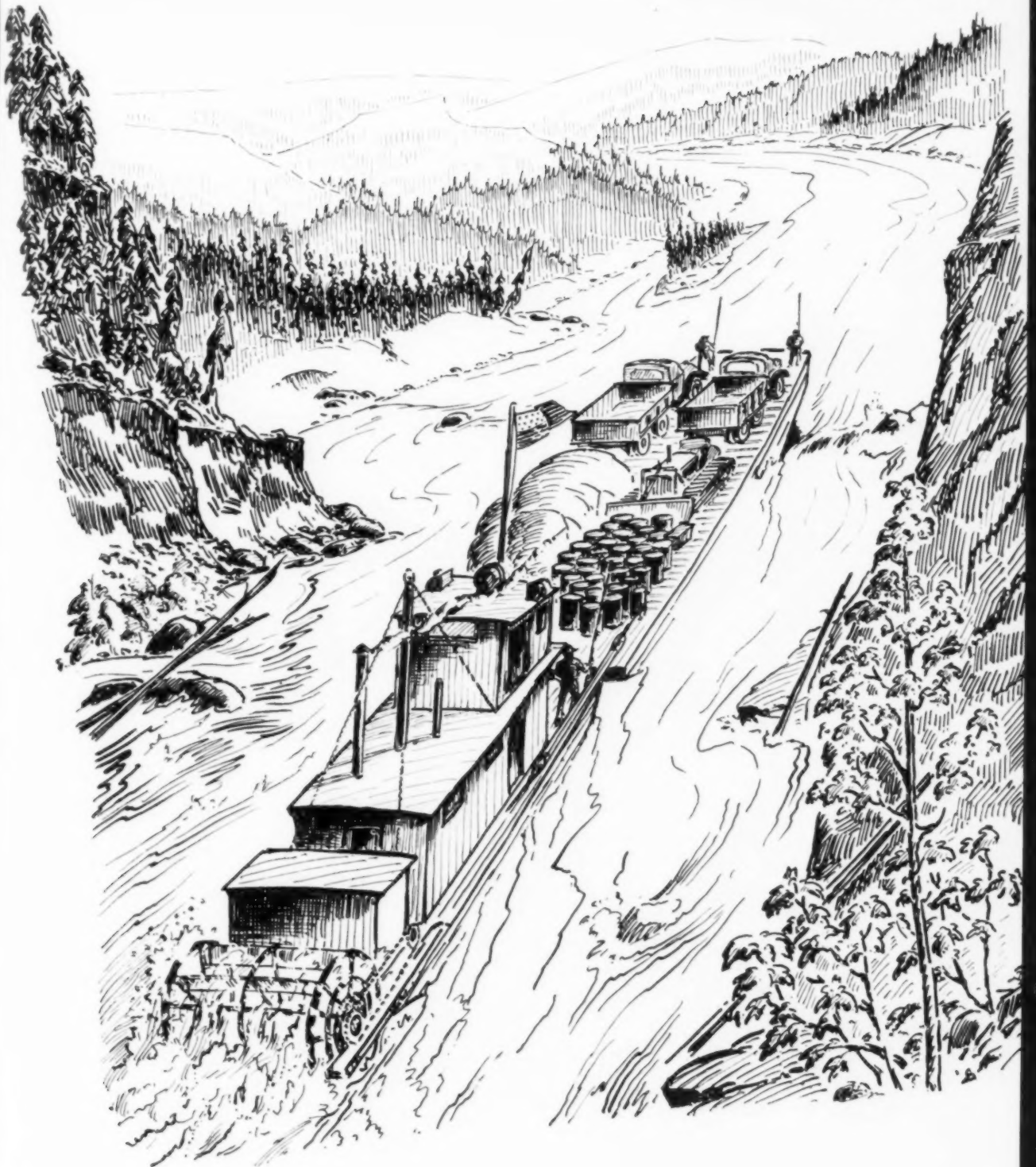
direction of Chinese engineers, was commenced in December, 1937, and the road was opened to traffic eight months later. Only hand tools, largely brought to the work by more than two hundred thousand coolies, were available to hew the grade out of the mountain faces and unstable hillsides, and to build upwards of 300 bridges and thousands of culverts. Nominal wages were paid, for men, women and children worked with a will for their country's freedom. Apparently the cost did not exceed \$3 million in Canadian currency, but mortality was high. In the field of pioneer construction, and prior to the general use of power equipment, the building of the Canadian Pacific Railway between Calgary and Vancouver is another outstanding example. Natural difficulties presented by a precipitous mountain terrain, which included the crossing of five mountain summits, were aggravated by problems of forwarding supplies and equipment, of securing and holding labour, and of financing the operation. Nevertheless, during the period 1883–85, construction of approximately 630 miles of railway was completed. This work involved the driving of 60 tunnels with an aggregate length of 13,801 feet, the building of steel bridges with an aggregate length of 2,014 feet, and 1,425 wooden bridges with an aggregate length of 147,732 feet, and of 28 snowsheds of the heaviest type of construction and with an aggregate length of 21,373 feet.

In selecting the route for the Alaska Highway, mountainous areas were avoided to the maximum extent possible. Consequently, much of the magnificent scenery to be found in northern British Columbia, Yukon Territory and southern Alaska, although but a few miles distant, is not properly seen from the highway. Nevertheless, impressive scenic views are to be seen at intervals, even though at times these intervals may be somewhat widely spaced. Thus along certain sections of the highway between Fort St. John (15) and

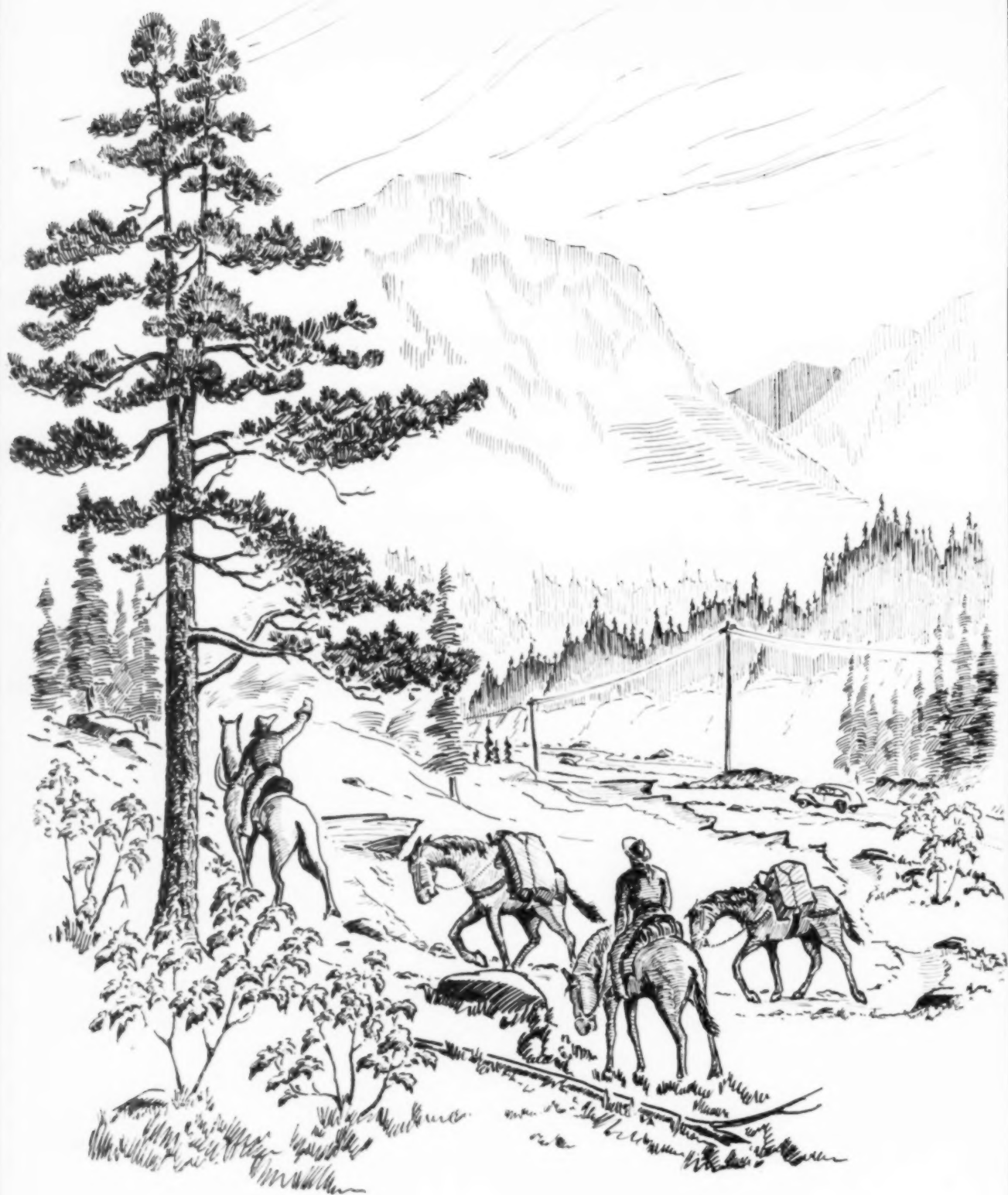
(14) At Northway during the winter of 1942–43, the temperature fell to 70° below zero.

(15) All mileages indicated are approximately correct but are subject to modification as revisions of alignment are made from time to time. Present mileages and elevations at a number of points along the highway are as follows:

| | Mileage | Elevation | | Mileage | Elevation |
|--------------------|---------|-----------|------------------|---------|-----------|
| Dawson Creek | 0 | 2,250 | Whitehorse | 917.3 | 2,300 |
| Fort St. John | 48 | 2,275 | Haines Road Jct. | 1,012.0 | 2,130 |
| Fort Nelson Jct. | 300 | 1,200 | Burwash Landing | 1,090.3 | 3,150 |
| Liard River | 495 | 1,400 | White River | 1,169.1 | 2,260 |
| Watson Lake Jct. | 634.6 | 2,200 | Northway Jct. | 1,265.3 | 1,780 |
| Teslin Jct. | 804.5 | 2,300 | Big Delta Jct. | 1,428.8 | 990 |
| Norman Wells Jct. | 836.5 | 2,390 | Fairbanks | 1,522.8 | 650 |
| Carcross Road Jct. | 865.4 | | | | |



A small amount of emergency freight was run down Dease River through the canyons of the Cassiar Range.



"There is an almost endless variety of routes to be followed, on foot, by pack train or by water."

Fort Nelson Junction (16), distant views of the foothills of the Rocky Mountains may be seen to the west. Some 50 miles to the northwest of Fort Nelson, the highway enters a hilly terrain and crosses the summit of the Rocky Mountains at Summit Lake (mile 405) at the relatively low elevation of 4,212 feet—the highest elevation on the entire highway between Dawson Creek and Fairbanks. Along the Summit Lake—Muncho section, the highway passes through some fine mountain scenery. At mile 495, the first crossing of Liard River is reached and from that point to Watson Lake Junction (17) the highway winds along river benches, usually high above the stream. The second crossing of Liard River is reached at mile 644, and the foothills of the Cassiar Range at about mile 700. In passing through this range, the summit of which is crossed at an elevation of 3,200 feet, the highway winds along the Rancheria and Swift Rivers, emerges from the foothills at mile 790, and reaches Teslin Junction at mile 804. From this point the route winds through open valleys marked by easy gradients to Whitehorse. Between Whitehorse and Kluane Lake, the scenery is possibly the most pleasing of any along the entire route. Beyond Kluane Lake and to the west lie the magnificent St. Elias Mountains rising to elevations of almost 20,000 feet, snow-covered Mount Logan, hundreds of square miles of ice-fields and perpetual snow and innumerable glaciers. To obtain adequate views of this scenery would involve detours, for which provision has not yet been made.

Yet undoubtedly the Alaska Highway will hold a strong appeal for many, many people. But it is not the appeal of endlessly recurring snow-capped peaks and mist-filled valleys seen along certain of the more southern and well established motor routes. Indeed, it is an appeal possessed by no other great motor route in the North American Continent, the appeal of venturing in comfort and safety into a great northern wilderness—a wilderness as yet largely unmapped and largely unexplored. It is the appeal of a great northern land which offers a healthful climate, unspoiled lakes and streams, unspoiled forests and mountains. For the so-called lure of the North is based on those primitive instincts

which most men inherit — which all normal boys manifest before their spirits become cramped by the straight-jacket of convention. It is a lure based on a desire to live a natural life free from the artificial and hampering restrictions of the thing called "civilization"; on a desire to enjoy health and simple comfort through the possession of a sufficiency of simple necessities; on the desire to overcome difficulties at the cost of healthy physical weariness. And it is indeed fortunate that the pioneer spirit of the men who conquered the West during the earlier part of the nineteenth century did not die with the passing of the lurching covered waggon. With many it merely slumbers awaiting the call, and for many that call will come from the winding Alaska Highway. For those who follow, the highway will pass through a country in many parts of which, prior to 1942, only the most sketchy trails existed—a country much of which was previously known only to a handful of hardy trappers and explorers. Increasingly rapid transportation, and possibly more extended periods of leisure, will gradually bridge the distances to one of the world's greatest natural playgrounds. It is of interest to note that already a telephone line, (18) 1,993 miles in length, connects Edmonton and Fairbanks; from nearly any point in Canada or the United States one can converse with all principal points along the highway.

For those who may wish to turn from the highway itself and to seek still newer horizons, there is an almost endless variety of routes to be followed, through practically virgin territory, on foot, by pack train or by water. The Fort Nelson River may be descended from Fort Nelson by motor-boat or canoe to the Liard, the Mackenzie—and beyond. The valley of the Kachika, the northern extension of the great Rocky Mountain trench, may be explored by pack train or on foot. Hemmed in for many miles by snow-capped peaks and towering cliffs of the main Cassiar Range, Dease River may be ascended by power canoe or motor-boat. Along these and many other land and water routes, the artist and the lover of nature will find scenery—and scenic effects—unexcelled on the North American Continent. For the angler

(16) Fort Nelson Airport lies approximately 5 miles to the east of the highway or at mileage 305.

(17) From this point, Watson Lake Airport (Elev. 2,220) is reached by a branch road 8 miles in length.

(18) Equipped also for telegraph and teletype. A telephone line has also been installed between Skagway and Whitehorse.

and the hunter, fish, game and birds abound. Nearly all lakes and streams are well stocked with arctic grayling, trout and whitefish; on the open alpine uplands are literally tens of thousands of ptarmigan. For many years, bear, moose, caribou, sheep, and goats have been plentiful in a number of areas north of Fort St. John. As an example, year after year prior to 1940, the Cassiar district attracted big game hunters from the United States and elsewhere, and it was not unusual for these men to organize hunting expeditions which, in individual instances, involved expenditures of up to \$10,000. More recently, in some districts, wolves have taken a heavy toll of the big game. If such ravages are checked now, the northern areas would soon regain and hold their former prestige among America's big-game hunters.

Meanwhile attention is being focused on the possible economic importance of areas tributary to the highway. This, and other correlated problems, are being considered under the auspices of the Joint Economic Committees of Canada and the United States. (19) Heretofore trapping and sport-hunting have constituted the principal activities, but there are indications that, during the coming years, these activities may gradually be extended to include mining, (20) lumbering, agricultural production — particularly along the southern part of the highway — and the development of such hydro-electric power as may be required. Decisions regarding the initiation of such activities will demand sound judgment.

Within that part of the area traversed by the Alaska Highway to the north and west of Watson Lake, the presence of a wide variety of metalliferous ores has been recognized (21). Within much larger areas, underlain by sedimentary strata, there are indications of the presence of coal deposits and of geological structures which might contain petroleum pools. The extent to which economic development of minerals may be possible will depend primarily on transportation costs. These, in part, will depend on the condition in which transportation routes are maintained and also on the extent to which "feeder" roads may ultimately be constructed. In

1943, a programme of geological exploration was initiated by the Dominion Government and by a number of mining companies. It may be noted that along and in areas tributary to the highway, forest growth, notably pine and spruce, constitutes a potential asset and is adequate for local requirements. Agricultural possibilities, more particularly in the northern part of the area, will apparently be restricted to relatively small areas. Future tourist travel will include many men who are motivated by the pioneering instinct. Such travel should therefore be encouraged. It should be noted, however, that the Alaska Highway will not be open to civilian traffic until six months after the end of the war. Even then, it will be necessary to establish gasoline stations, repair garages, and overnight accommodation for tourists.

In the design and construction of highways, the basic factors of drainage and stability of bases, have been recognized since very early times. Certain standards — particularly with respect to grades, alignment and surfacing — have been progressively revised in keeping with the evolution of transportation vehicles, and of volume, character and speed of traffic. These — and the future development of air transport — will be the factors which will dictate the final evolution of the Alaska Highway as a transportation route.

Meanwhile, as of December, 1943, there has come into being — and with proper maintenance (22) will be available — a serviceable highway between Dawson Creek and Fairbanks, adequate for present traffic requirements during winter and summer, and with relay stations at intervals of approximately 100 miles. This highway will permit of, and is now being used for the movement of heavy traffic at an average speed of not less than 25 miles per hour throughout its entire length. The maximum speed limit has been officially established at 35 miles per hour although higher speeds are practicable over much of the route. The gravelled surface has an average width of 20 feet, with increased widths at many curves. As in the case of practically all new road construction, and especially in the present instance where the limited

(19) Camsell, Charles: "Planning of the New Northwest", *Canadian Geographical Journal*, December, 1943

(20) Thomas, L. D.: "Mineral Possibilities of Areas Adjacent to the Alaska Highway", Part. I, Yukon Section, Bull. C.I.M.M., November, 1943

(21) Camsell, Dr. Charles: "Investigations into the Economic Development of the Canadian Portion of the North Pacific Region", Address before the Canadian Institute of Mining and Metallurgy, November, 1943

(22) Strong repair crews with adequate equipment to ensure necessary maintenance at all seasons of the year have been established at frequent intervals along the entire length of the Alaska Highway.

time available was the controlling factor, the desirability of revisions of grades and alignment is recognized and such revisions will result in marked improvement. Undoubtedly in certain localities, where adequate provision for drainage has not yet been made, some gravel will disappear and muddy conditions will develop. At such places, however, gravelling and improved drainage will remedy this defect. Moreover, it is natural that during dry weather, dust will adversely affect comfort and safety. If justified at some future time, the use of dust layers or hard surfacing will meet the situation. At a limited number of stream crossings there has, as yet, been no opportunity to study flood conditions over a period of years. Consequently, for a time, and in isolated instances, some damage to bridge structures may be anticipated. As a result of the above, initial maintenance charges will be relatively high, and, for a time, it may be desirable to close certain sections of the road to heavy traffic during short periods in spring and fall.

It may be noted that an all-weather road between Edmonton and Dawson Creek — which is also the western terminus

of the Northern Alberta Railways — has been considered but is, as yet, not available. Such a road would traverse a gently rolling terrain which would present no serious engineering problems. Much of the area is settled and is readily accessible over presently available communications. Meanwhile, mileages along the Alaska Highway commence at Dawson Creek — 572 miles northwest of Edmonton by the present somewhat circuitous road.

The construction of the Alaska Highway through the Pacific Northwest, the anticipated construction of subsidiary road connections, and other developments now taking place in the Northwest Territories, should prove to be important factors during the coming period of post-war reconstruction. For under the driving stimulus and stress of war, a new era is dawning in Northwestern Canada, (23) an era which may ultimately include within its geographical boundaries even certain of the great land areas of the Arctic Archipelago. Conceptions of the significance of the term "Canada's New North" are once more being revised; in the coming air age, such conceptions will be still further revised.



"For the angler, fish abound."

(23) The aerial extent of the Canadian part of the Northwest Pacific, Yukon Territory and the Northwest Territories exceeds 1.5 million square miles or two-fifths of the area of Canada.



Taking documentary movies for Canada's rural film circuits, cameramen visit every section of the Dominion. This picture entailed a climb over arduous mountain trails.

CANADIAN MOVIES PROMOTE CITIZENSHIP*

by DONALD BUCHANAN

CANADA is a nation dominated by geography. It is almost a truism to state that the immense distances and the scattered locations of our provinces make an integrated citizenship difficult to achieve. The motion picture, used as a vehicle for citizenship, however, can do much to promote national understanding. In fact, as far as Canadian farm families are concerned, the war has brought few developments which touch them closer in their social life than do the travelling theatres of the National Film Board. This project now serves, each month, an average audience of four hundred thousand rural folk. Thus, a new kind of "Movie Night" has sprung into being in hundreds of Canadian villages and country crossroads.

These audiences not only see films about the war and its relation to democracy, but they also watch pictures about farm production and the life and industry of every section of the Dominion. National unity comes alive, takes form and substance on the screen.

The history of this undertaking goes back to December, 1941. On that date, John Grierson, the Dominion Film Commissioner, and Herbert Lash, who was then Director of Public Information, decided that the talking picture, with its combined appeal of voice and visual image, was the best medium for carrying the message of fighting Canada to all those communities of varied racial origin which make up rural Canada, from east to west. They

*Photographs courtesy National Film Board of Canada



From a newsreel sequence taken in British Columbia. Canadian troops of a supply unit engaged in training operations.

lost no time in putting their thoughts into action. Willing helpers were found among those many Canadians who, for years, had wanted to use the motion picture as an instrument of civic instruction; some were on the staffs of our universities, others were connected with the provincial departments of education. By telephone, some half-dozen of these enthusiasts were immediately appointed as regional agents for the project, and by telephone, too, they were given instructions as to what type of projectionist to hire, and in general how to conduct organization in the field. So, in less than a month, thirty mobile units were on the road. To-day, a little more than two years later, there are seventy of these travelling theatres across Canada, in every province from Nova Scotia to British Columbia. The communities served range from North Star, in the Peace River district of Alberta, to Nipigon in Northern Ontario, from St. Louis du Ha Ha in Temiscouata County, Quebec, to Pubnico Head, Nova Scotia.

Each of these farming or fishing villages is visited regularly once a month — on a specific day well known in advance to all local residents. Local committees do all the arranging for halls and publicity. Although projectionists usually travel by automobile, sometimes they go by train, and, in the depth of winter, when highways are blocked, they have to hire sleighs. With few exceptions, they always manage, despite sleet and blizzard, to present their shows on time; indeed, it would not surprise the officials of the Film Board if, this winter, they heard that some of the projectionists were demanding allowances for frozen fish to feed their husky dogs!

Throughout, there has never been any question of competition with commercial theatres. The circuits are restricted to villages where motion pictures are not normally shown. Round Lake St. John in Northern Quebec, whole parishes reported that these were the first talking movies they had ever attended. And that is not all. In certain Mennonite and Ukrainian dis-



tricts of the Prairies, the old folk and youngsters, too, claimed they had never seen movies of any kind before. In one place in Saskatchewan, an aged Mennonite turned up and sat excitedly with his eyes facing the projector! It had to be explained to him that he would see the pictures best by turning round and watching the screen, not the machine.

How are the programmes composed? There has to be a new group of films each month. They have to be made up to appeal to every race and section of the nation; for example, *Trois Pistoles*, Quebec, views the same subjects as does *Salmon Arm*, British Columbia. The war subjects are not restricted in origin by any means; they are produced in London, Sydney, and Washington, as well as in Ottawa. Pictures, edited in Canada, about the Chinese and Russians are also included, and there was even a Brazilian offering recently. Other shorter films deal with specific problems of agriculture, while some are designed to appeal to the housewife. There are hints about conservation of clothing, and explanations of rationing and of food values.

Usually the screenings last eighty minutes. The films are of 16 mm. size, offering about a quarter of the negative area of the standard 35 mm. films used in commercial theatres, but modern portable projection equipment allows them to be shown with suitable quality of presentation in even relatively tiny halls.

On the day the projectionist arrives in a typical community, he goes first to the local school where an afternoon showing is held for students. Then, in the evening, a screen is put up in the community hall or church basement. The shows are free, although sometimes silver collections are taken for the Red Cross or for other patriotic

Top to bottom:—A cameraman and a director from the National Film Board photographing a manual training class.

Barry's Bay, Ontario; youthful audiences attend a citizenship movie show.

This whole village in rural Quebec has turned out to see an open air screening on the walls of the village church.

Many of the families in Barry's Bay are of Polish origin. Some of the younger members put on a folk-dance before the show.

funds. Much of the success of the performances can be credited to energetic farm women, who plan social hours and suppers after the screenings. In this the Women's Institutes, the I.O.D.E., and the Home Makers' Clubs play a great part.

More and more these travelling theatres, with their emphasis on citizenship, are becoming the focus of village life. For example, in Manitoba, through expert assistance provided by the rural extension service of the provincial university, "Film Forums" have been started. An assembly of this nature is made up as follows: for an opening, a sing-song film; then motion pictures of Canada and the United Nations; afterwards a question period led by the local chairman. Sometimes these discussions are replete with suggestions for action. One projectionist, Peter Brown, reporting from the Gretna area of Manitoba, states: "Interesting ideas for post-war reconstruction are now and again expressed at these Film Forums with practical details such as: the provision of water and sewage systems in the smaller towns; the establishment of more technical schools; the erection of more public libraries; and rural electrification after the war".

One interesting sidelight concerns the school and the community. Through teaching projects related to these showings, the adults of many communities have for the first time become thoroughly conscious of the topical scope of many classroom activities to-day. For example, in the Okanagan district of British Columbia, the best essays written about these citizenship films by local pupils — exciting compositions on "A Heritage We Guard", "Inside Fighting Russia", and "Women are Warriors" — have been printed by the editors of the local weekly newspapers. Thus the *Similkameen Star* in Princeton, the *Salmon Arm*



Top to bottom:—Three good arguments for motion pictures as teaching aids.

West coast Indian children on their way to see a screening.

Young people of varying ages pour into the hall at Appleton, Ontario.

The travelling projectionists of the National Film Board go to lumbering camps as well as to farm communities. Here the photographer takes a picture of a typical audience.

News, the *Enderby Commoner*, and the *Vernon News*, use these student essays as regular monthly contributions.

In each province, the school showings are directed toward citizenship aims. Children are encouraged to prepare descriptive compositions, and the teachers or projectionists often arrange to give small prizes for the best ones. Here is how one little French-Canadian girl, aged fourteen, from a village in Northern Ontario, in apt lyrical fashion, summed up her feelings after she had seen the documentary film "Forward Commandos".

"I am a little girl fourteen years of age, but I too can be a Commando. There are those here who ask, how can you do that? Well, here is my answer. I can work for the soldiers by knitting, by buying War Savings Stamps, by making small sacrifices, and by economizing even in school, by not wasting paper and other material, and by not raising objections to the rationing of any item. Yes, let us work for victory, that victory which we have been seeking so long. Only have confidence and we shall win this war. Yes, win this war.

Let us then be patriots, true patriots and leave aside complaints. Let us be gay. Let us sing songs of victory."

The country school teachers have their scholars study in advance the contents of the leaflets describing the films, and so when the National Film Board projectionist arrives at these schools, the first thing he does before the screening begins, is to conduct a "quiz" on the contents of the booklets.

During the winter of 1942-43, most projectionists had to buck snowdrifts and sub-zero weather for months on end, yet not even the worst conditions of weather ever daunted them. Their motto was "the show must go on". Most of them found their reward in genuine evidences of local appreciation. After relating some of their community gestures of good-will, A. F. Mitchner, who operates a rural travelling theatre out from North Battleford, Saskatchewan, gave this poignant note of human interest. To quote his own words: "The incident concerns a widower of seven years past. This man informs me that he has come to town during the last seven years only when the

At least one war information film is shown on each programme. Rotterdam from the picture "This is Blitz".





Canada's production of spruce for war purposes is explained in a newsreel.

need for supplies made the trip necessary. He visited one of our showings last fall and was very pleased. Since then he has never missed a showing. On his last trip he had to brave a strong wind and a temperature of forty below zero to walk seven miles to town, all because it was the day the Free Movies were in town. This man can neither read nor write. His great worry is that he may get the wrong date fixed in his mind. Thus, after each showing, he asks me, not once but several times, when I will be in town again. After this is firmly fixed in his mind, he shades in the date on a calendar. It is a revelation to see the morale improvement in this once apparent outcast. Is this one saved soul not of greater value than three or four hundred patrons who have received most of earth's blessing and who attend merely to be amused?"

Some extremely remote points are visited by these travelling theatres. R. B. Anderson, on his circuit in northern Manitoba, is on the verge of frontier settlements. "At a small place called Barrows," he reports, "I travel five miles by sleigh from the railway to visit a country

school. Here the whole community, mostly half-breeds, turns out. And at Barrows itself," he continues, "about one hundred and twenty-five people always flock into the pool room, the largest place in town, to see the show. The Indians present come from miles away, in sleighs, on foot, or by dog team."

Mr. Thomas Prime, who operated a circuit during the summer months in the northern interior of British Columbia, visited the Tweedsmuir Park area which is over fifty miles from the railway. He reported that in some of these communities, people came vast distances to attend the showings. "At one point a group travelled forty miles by canoe, others anywhere from five to twenty miles, sometimes even on foot. We are in touch with people who know little or nothing of world conditions of the present day. In fact they are out of reach of all communication. The showings have drawn people that have seen a moving picture for the first time. Every known type of hall has been used for the presentations, including attics of stores, log cabins, and at one point we had to show in the open."



A Ukrainian Canadian farm woman. This picture is from the film, "Peoples of Canada".

Hungarian newcomers who work in the beet sugar fields of Alberta are among the audiences served. This is Elizabeth Szabo who has been in Canada six years.



Above left:—One of the most popular films about folk customs in Canada is "Ukrainian Christmas Holiday".

Above right:—A folk-dancing festival put on by Polish Canadians in Manitoba.

The monks at the monastery of St. Viateur, in the far distant colonization area of Abitibi in Quebec, requested and obtained special screenings once a month during most of 1943.

Time and time again the film showings are merged with other wartime activities in these small communities. To demonstrate how successful this partnership can be in practice, one can do no better than repeat here in full the statement sent in by the Inwood (Manitoba) War Savings Committee:

"The Inwood War Savings Committee was first organized in January, 1941, for the purpose of promoting the sale of War Savings Stamps. In the fall of the same year, the National Film Board and the Adult Education Services of the University of Manitoba offered to put on a series of free educational picture shows if some local institution would sponsor these.

"The Inwood War Savings Committee gladly accepted this small responsibility and, for the first two months, the shows were held in the Lutheran Church. Each month, a show was held in the afternoon, and all the school children for many miles around attended. The second show was put on in the evening for the adults. We found the people were so interested that we were obliged to seek a larger hall to accommodate them. The local hall was rented, but provision had to be made for the payment of the rent, so it was deemed advisable to put on a dance after the show, in order to raise money to meet expenses.

"The dance turned out so well financially that we had a considerable amount of

CANADIAN MOVIES PROMOTE CITIZENSHIP

money on hand for the future, so it was decided that a dance should be put on after every show, and the proceeds put to some good use. The Inwood Women's Institute co-operated with the Committee and looked after the serving and selling of lunches at each dance and turned over the proceeds of the lunch sale to our Committee.

"At the dance we gave a door prize of one \$5.00 War Savings Certificate. Then we put on a draw (raffle), whereby at least four good prizes would be donated by some persons interested, and tickets were sold on this draw. The proceeds from the dances, including the money received from the draws and lunches, made a grand total of \$475.00.

"To date, we have sent cigarettes to the lads overseas to the value of \$98.00. We handed \$80.00 to the Women's Institute to assist in sending Christmas boxes to

every lad that is overseas from this district. Then we sent \$127.00, the proceeds from two dances, to the Russian Relief Fund. After all expenses were paid, we still have \$12.00 on hand and a \$50.00 Victory Bond."

In some senses a panorama of Canadian opinion — the rural point of view at least — can be obtained from the expressions voiced after the evening showings. For this reason, the projectionists are now being trained to gather and to make reports on these opinions, so that there may be a two-way transmission of ideas — interpretations of democratic plans and war objectives presented to the people in these films, and, in return, comments and suggestions collected and sent back to Ottawa. So to this end, regional training conferences for projectionists were held in Saskatoon and at Macdonald College in Quebec during August, 1943. This method,

Right:—A typical farmstead of Polish immigrants in a district served by the National Film Board in Manitoba.

Bottom right:—From "Farm Front", a movie especially designed for rural audiences.

Below:—Another scene from the film "Ukrainian Christmas Holiday".





of course, is still new and relatively experimental. Yet what has taken place in various communities to date proves that this is rapidly becoming a worthwhile venture in the use of modern means of communication in the service of citizenship. At the moment, the comments received are serious and sustained in vigour. Documentaries which merely give the broad outline of global strategy are criticized — more detailed treatment of specific achievements and projects is asked for; as one projectionist puts it, "the primary objective" of these programmes should be that "of giving the people a more complete insight into our war effort". So more motion pictures of this nature are being made to fill the demand.

From "Ottawa on the River"—a movie about regional industry

Special newsreels about Canadian resources and the war are made up each month. Scenes of spruce logging in British Columbia





This little Eskimo is camera shy. No wonder, for this is the first time he has ever been interviewed by a movie director!

Eskimo songs being recorded in Baffinland. They will be used later in a film for schools



There are also many requests for films about post-war reconstruction. These come from all sections of the country. To-day the building of programmes is related closely to the needs of the rural audience. Then, too, a close co-ordination between these films and the topics discussed each week on the broadcasts of the National Farm Radio Forum, has been achieved. In fact special 16 mm. films such as "Farm Front", "The People's Bank" on credit unions, and "Hands to the Harvest" about agricultural labour were produced during the past season for use in conjunction with these radio programmes. There is more emphasis now on the contribution of the individual in this struggle, and of the part the ordinary citizen plays in democratic planning. This change in emphasis, according to the regional agents, has become "one of the

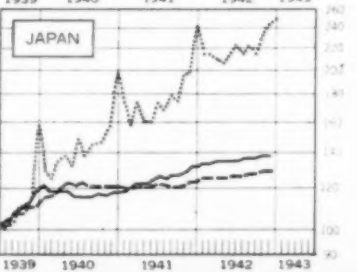
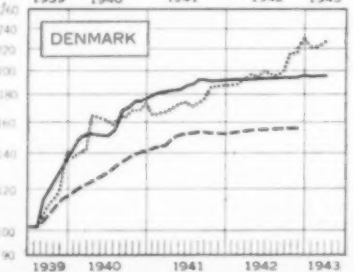
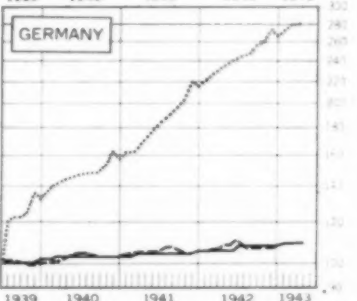
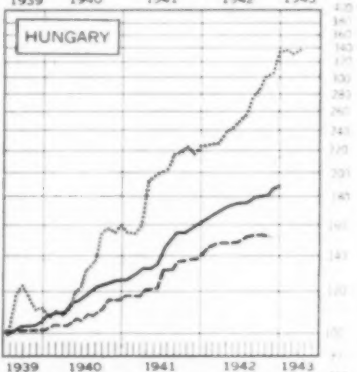
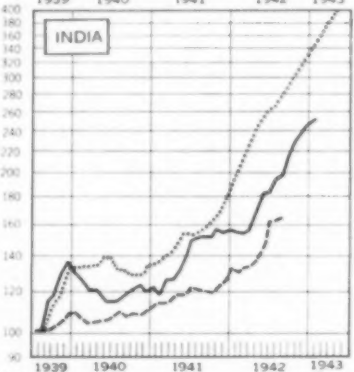
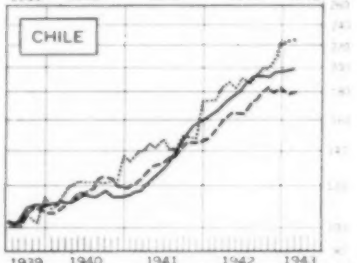
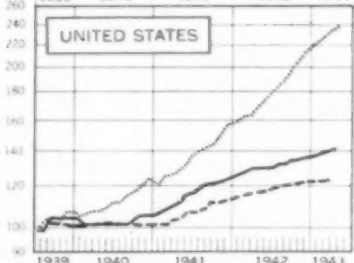
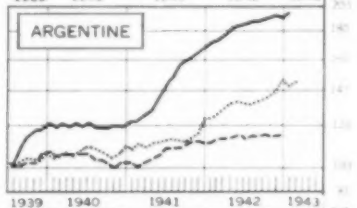
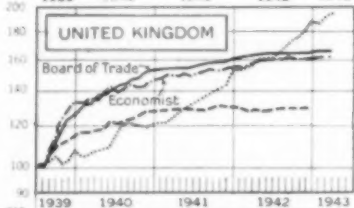
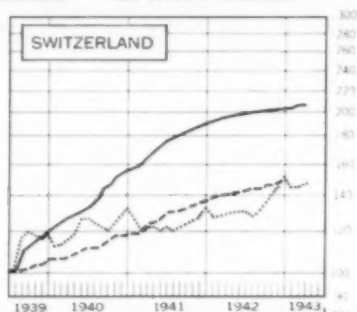
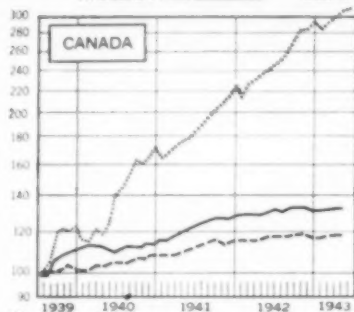
chief factors in stimulating interest and intelligent discussion". As for the future, one report comments, "I think we should learn more in films of the different peoples of Canada right now—so that when the present conflict is over we may be able to understand our neighbours a little better and have a higher degree of tolerance".

A scene from "Thought for Food", which explains food raising in terms of nutrition.



MOVEMENT OF WHOLESALE PRICES, COST OF LIVING AND NOTE CIRCULATION

Wholesale Prices ——— Cost of Living - - - - - Note Circulation



THE WHY AND WHEREFORE OF WAR FINANCE

By C. M. SHORT*

THE new taxes, ration regulations, material allocations, official price fixing, wage stabilization measures and public war loan campaigns of this period are all part and parcel of a modern war finance system, as well, of course, of economic mobilization on an unprecedented scale for a conflict involving, in varying degree, nearly 90 per cent of this globe's population and requiring about half of the world's productivity.

Governments in the past have customarily left private incomes relatively undiminished in time of war, and created their own purchasing power by means of bank credit, note expansion, or currency debasement. This, it must be admitted, achieved a solution of both the material and financial side of the problem of war finance, for it not only gave governments the money with which to purchase (divert) the portion of the national product to be devoted to war uses, but it also inflated the national currency, and therefore the cost of living, so much that individuals' incomes were able to purchase only that share of the national product left over for private use. That, however, was the inflationary method of war finance, the very method that is sought to avoid in this war.

The basic problem in the new technique in war finance is to divert by physical as well as monetary measures goods and services away from civilian use and into governmental uses for war, without allowing inflationary elements, always characteristic of war, to become as explosive as they have in the past. Perhaps it is unnecessary to point out that war material for current use cannot be borrowed from future production, or that future generations cannot be expected to abstain from butter so that guns can be made to-day. Least of all should the purchasing power of money in peacetime be lowered considerably, as it has been in former post-war periods, by financing martial programmes through excessive currency issue or credit inflation.

We can pay for the war now, financially as well as materially. As capital goods are diverted to government use by priorities and allocations, the money that business would normally spend for them can likewise be so diverted. As consumption goods are diverted to government use by government purchase, the money that consumers would normally spend for them can likewise be so diverted.

The problem, then, of paying for the war is a two-sided one. On the material side, it is the problem of diverting goods and services away from private uses. On the financial side, it is the problem of diverting purchasing power away from private uses. Although the material and financial sides are complementary parts of the same problem and might logically be combined to achieve a sound financing programme, the problem is greatly complicated by the ability of a government to create its own purchasing power without thereby reducing that of the public.

Specifically, the new technique of financing war is as follows:

The war should be financed as largely as possible, though not entirely, by taxation. This obviates, or at least restrains, inflation, minimizes post-war debt problems and lessens the necessity for extensive and prolonged price controls and rationing throughout the entire economy. Any remaining excess purchasing power in the hands of individuals should be absorbed by government bond purchases.

Funds needed by the government over and above those raised by taxation and by bond sales to individuals can be raised by bond sales (perhaps compulsory, though here compulsion is less necessary for obvious reasons) to corporations, insurance companies, savings banks, fiduciaries, etc.

The general financial effects of this war on prices, cost of living and currency systems are portrayed in the accompanying charts. Space considerations here, as well as incomplete data in certain areas, preclude description of the singular events behind

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the movements in the countries included in the charts, but a few outstanding cases can be dealt with in some detail.

Italy has been a victim of unsound war finance as well as of Nazi invasion. After a vain-glorious Roman holiday under two decades of Fascist bureaucracy, (which stripped the country of most of its financial reserves) we learn from reliable non-Fascist sources that the country's war expenditures increased by less than 30 per cent during its active participation in a conflict that required the greatest possible armament effort. This comparatively modest effort doubtless goes far to explain the equipment shortages and weak resistance of the Italian forces. Yet not much more than one-third of the Fascist Administration's total outlays was covered by taxation, the major part being met by currency issues, which raised the note circulation about four times in the three years of Italy's active belligerency.

Germany had a war finance policy well in advance of her first military move. She had developed full control over the productive and monetary systems of the country. She had already imposed rationing of goods and services upon her public. When Germany started this war she required merely to tighten her economic controls so as to hold the cost of living from rising by more than 8 to 10 per cent (so German authorities claim) to prevent at first serious inflation of her own currency and to cut by 1942 the consumption of civilian goods by at least 25 per cent below that of 1938. She has, however, adopted other money-raising expedients of a highly inflationary character, both inside and outside Germany. Apart from a marked rise in her currency issue in the past two years, her borrowings from the Reich central bank have tripled since 1939, and it is believed that a very large amount of "army bills" and other requisition instruments have been floated. Moreover, she has drawn huge quantities of materials from occupied countries and neighbouring neutrals through confiscation; trade agreements altogether in her own favour; barter arrangements, which she has not implemented fully on her side; and depreciated commodity prices of countries under her control by artificial exchange rates.

Worst of all, Germany's immense occupation costs, imposed on countries she has overrun, have been met partly, if not wholly, by deliberate inflation of the currency and bank credit systems of her victims. Taking German-occupied countries as a group, the currency issue is at least four times that required for the volume of trade.

Britain's methods were of a later origin and less rigid nature than Germany's and developed more gradually, but quite thoroughly and effectively. Price control has actually been supplementary to control over practically all production, imports and distribution but with some leeway for the normal functioning of business, even for increased prices and higher wages if such rises are necessary to induce more production. With almost complete control over industry and trade (including overall rationing of goods and services) combined with mobilization of over 70 per cent of the economic resources for war purposes; with the greatest public support for national defence of any belligerent; and with subsidy payments of over \$700,000,000 per year to hold down prices, the cost of living index, though 28 per cent above the pre-war level (owing mainly to higher prices of imports), has undergone practically no change during the past two years. Most important of all, however, expenditures for civilian consumption have been reduced by about one-fifth below the pre-war level, although the national income has since risen by 50 per cent, which serves to explain a record currency issue. This great curtailment in personal expenditures has undoubtedly been responsible for the collection of taxes about double those in 1938, (taxes cover over 40 per cent of all government outlays), for raising public savings more than six-fold, for small government borrowings from commercial banks (less than 10 per cent of all governmental expenditures) and, generally, in aiding greatly in the effort to spare Britain the evil effects of unrestrained inflation.

In the first two years of active participation in this war the United States has borrowed over \$100,000,000,000, of which nearly half has been obtained by security sales to the commercial and Federal Reserve banks. It should be emphasized,

however, that most of this bank credit inflation took place before the Third War Loan launched in September, 1943, for by then it had become clearly recognized that borrowing from the commercial banks, instead of diverting existing purchasing power to the war effort, created entirely new funds and, of course, new purchasing power. Only about a third of the Federal Government's requirements has been obtained by taxation. Formal price control was not begun until the spring of 1941, and for a year or so extended only gradually to materials basic to the war effort, while retail prices remained uncontrolled until May 1942. There is probably no need to elaborate here on the difficulties since encountered in making price and wage controls effective, although it is only fair to say that both prices and wages would be much higher if these restrictions had not been instituted. Under existing conditions, however, the consumption of civilian goods has increased by more than 15 per cent since 1938, and there is an excess national income (the amount of money earned in excess of the amount of civilian goods) of well over \$35,000,000,000. There has been no deliberate currency inflation, but the note issue is about double that of 1939, for which more active business conditions, hoarding and a lack of banking facilities in many rural districts, and even in some large employment centres, are regarded as responsible.

In Canada the inflationary forces of war were boldly attacked even before the outbreak of hostilities. It seems not to be generally known that the Dominion Government designed far-reaching non-inflationary measures some days before it declared war by an Order-in-Council providing safeguards against any undue price increase in the necessities of life and to ensure an adequate supply and equitable distribution of commodities. A few months later these powers were extended to provide for investigation of costs, prices and profits; to license dealers in any way in the necessities of life; to fix maximum prices and mark-ups; to regulate the sale and distribution of the necessities of life; to take possession of stocks withheld from the market; to buy and sell goods; and to recommend embargoes on exports. All these powers have since been implemented under powers given the Wartime Prices and Trade Board and the Department of Munitions and Supply.

Apart from moderating price increases in commodities and in wages under control, the Canadian financial system has aided several measures of an anti-inflationary character, including the collection of taxes to cover nearly half of the war costs, and the sale of all war loan bond issues to the public, a form of income diversion which has limited bank credit for war purposes to comparatively small proportions. Retail sales, after allowance for higher prices, are fully 20 per cent above those of 1939 and, combined with expenditures for services, amusements, transportation, medical attention and telephone and electrical utilities, are estimated at over \$4,000,000,000 for last year, which with taxes (Dominion, Provincial and Municipal) absorbed nearly \$7,000,000,000 of a total national income of about \$9,000,000,000. Currency in circulation has about doubled since 1939, mainly because of the exceptional activity in trade.

Wherever it has been applied the new technique in war finance may so far be regarded as a great improvement on any previous martial monetary system. But it cannot be described as entirely successful unless there is such a diversion of excess income as to prevent consumption of civilian goods from rising above the pre-war level, for purchasing power greater than the available supply of civilian goods and services is in itself a highly inflationary element, one that can undo most, if not all, of the successful non-inflationary measures. This inflationary element can be short-circuited by complete rationing or by higher taxation. Either of these courses is, under present conditions, difficult, perhaps impossible, in a country like Canada. Moreover, there is a pleasant alternative, namely, the forthcoming Victory Loan campaign, which, if reaching, or exceeding, its objective will divert much of the excess national income from goods and services to an investment not only in future goods and services (which are certain to be better and cheaper than those now available) but, also, an investment in Canada's future nationhood, resourcefulness and welfare. This campaign will be more than an effort to raise war money. It will be an opportunity to renew the faith of Canadian people in their country. It will be, too, a great national enterprise in which there can be no minority interests, but only complete unity of purpose and action, a unifying movement of deep and lasting effect.



THE CANADIAN FORESTRY CORPS

1940-1943*

by MAJOR GEORGE F. G. STANLEY

IN a day of tanks and guns, battleships and bombers, popular imagination tends to seize upon steel as the one great raw material of modern warfare; the importance and value of wood is sometimes overlooked. Nevertheless wood remains one of the essential aids of the fighting services. From the factory on the home front to the scene of battle, ply wood, building lumber, pit props, pulp wood, railway sleepers and boat skins are to be found in every phase of combat; in the air, on the ground and in the sea. Wood is used to construct certain types of aircraft; it is used to build hangars, huts, barracks and docks; it is used to make the hulls and fittings of landing craft, patrol vessels and motor torpedo boats. Without wood the modern army, navy or air force would operate under a very serious handicap.

The first forestry units in the history of the Canadian armed forces were those formed at the request of the British Government in 1916. The shortage of timber and the impossibility of finding ships for increased imports from abroad had become a matter of serious concern; and it was natural for the New Brunswick-born Secretary of State for the Colonies, the Rt. Hon. Bonar Law, to turn to Canada for assistance. In February he cabled the Governor General to the effect that the British Government would be grateful if the Dominion would furnish a battalion of lumbermen to exploit the forests of Great Britain. The 224th Canadian Forestry Battalion was organized without delay and early in May began to produce sawn lumber at Virginia Water Camp, Surrey. This unit was only the first of many which followed, and, in

October, 1916, authority was granted for the formation of a Canadian Forestry Corps.

Before the conclusion of hostilities in 1918 the Corps had extended its operations from Southampton to Inverness in Great Britain and from Bordeaux to the Jura Mountains in France. The total strength, all ranks, including attached labour, amounted to 31,447 in November, 1918; while production of sawn lumber up to the end of that year totalled 813,541,560 f.b.m. According to the Report of the Ministry, Overseas Military Forces of Canada, 1918, "over 70 per cent of the total timber used by the Allied Armies on the Western Front was supplied by the Canadian Forestry Corps".

It was the realization of the continuing vitality of wood in modern total warfare and the memory of the contribution of the Canadian Forestry Corps from 1916 to 1918 which prompted the Rt. Hon.

* Some of the companies have been transferred to Canada since this article was written.

Top left:—Road building in the Highlands with a Canadian bulldozer.

Left:—Canadian fallers at work in the Scottish Highlands

Right:—A two-and-a-half-foot Scotch pine goes up the Jack ladder into the mill.

Note on the Illustrations:—The photographs used to illustrate this article are Canadian Official Military Photographs. The illustrations also include reproductions of a group of drawings by Captain W. A. Ogilvie, a Canadian War Artist.





A plank being put through the edger in a Canadian sawmill in Scotland.

Anthony Eden, the Secretary of State for the Dominions, in the early months of the war to ask the Canadian Government if they would be prepared to despatch forestry units for service in Great Britain and France under financial arrangements similar to those under which the Canadian Forestry Corps had operated during the last war. No immediate action was taken to mobilize the companies requested. It was the period of the so-called "phoney" war, and the need for lumbermen was regarded as neither urgent nor pressing. Negotiations were, however, carried on, and, in June 1940, it was agreed that Canada would provide twenty forestry companies. All necessary arrangements were then made with the War Office and the Ministry of Supply by Major-General the Hon. P. J. Montague, Senior Officer, Canadian Military Headquarters. In view of the fact that these companies were being formed at the specific desire of the British Government and for British purposes, the cost of maintaining the Corps was to be shared between the two governments. The Dominion assumed responsibility for pay, pensions and cost of transport to and from Great Britain; while all expenses connected with technical equipment or maintenance were to be paid by the United Kingdom.

The spring of 1940 witnessed a rapid break in what the Rt. Hon. Winston Churchill had referred to as that "strange and unnatural calm". In April the Germans invaded Denmark and Norway; in May, Holland and Belgium. The success which attended these thrusts, together with the increasing intensity of the Battle of the Atlantic and the heavy demands upon shipping for the Middle East and other theatres of war, constituted a state of affairs not dissimilar from those which had led to the formation of the original Corps in 1916. More than ever it was essential to increase the British output of

sawn lumber. And with their experience of lumbering, their up-to-date methods and their machines, the Canadians were the obvious men to make the most of the British timber resources.

The original plan contemplated the formation of twenty companies, of which ten would operate in Great Britain and ten in France. The unexpected collapse of our continental allies reduced those companies intended for France to the position of "doubtful starters", nevertheless recruiting for the Corps continued throughout the summer of 1940. In October the Advance Party left Canada for overseas, and, two months later, the first company, from the Head of the Lakes, landed on the shores of Scotland.

Scarcely had the first companies been mobilized when another request was submitted by the Secretary of State for the Dominions that the number of companies to be sent overseas might be increased. This the Canadian Government agreed to do. Ten more companies arrived in Scotland during 1941 and 1942 until, finally, thirty Canadian Forestry companies were to be found throughout the length and breadth of the Scottish Highlands. Here among the glens which once resounded to the cries of Montrose's Highlanders and the ring of Dundee's claymores are to be heard the shouts of Canadian lumbermen and the crash of falling timber. The whole of the Highland country, with its mountains and moors, its lochs and burns, is replete with historical traditions, true and legendary, to which the Canadian Forestry Corps are now adding others.

Personnel of the different companies were recruited from all parts of the Dominion of Canada; from the Pacific Coast to the Head of the Lakes, from Quebec to the Maritimes, even from the supposedly treeless prairies. English-speaking and French-speaking, white men and red, skilled and unskilled, hastened to volunteer their services. A large number of them were veterans of the last war. Many were enlisted to fill the same positions in the Corps which they had occupied in civil life as sawyers, mill operators, storemen, loggers, cooks and mechanics. Some came from the big pulp and paper companies of Eastern Canada; others from the small semi-portable mills to be found in all parts of the Dominion; still others were without experience of lumbering of any kind and

looked upon the Corps as a new adventure.

The Corps began with the great advantage of having among its officers men who were not only connected with the lumber industry in Canada but who also possessed knowledge and experience of timber conditions overseas. In command of the Corps was appointed Brigadier-General John B. White, D.S.O., E.D., of Montreal, who had commanded the Canadian Forestry Corps in France during the last war and who, for some time, had been Deputy Director of Timber Operations with the British Forces with the rank of Brigadier-General. General White had been intimately associated with the timber industry all his life. At the time of his appointment he was Vice-President and Director of Canadian International Paper, and President of the Canadian Forest Industries Association. At the same time General White was a militia officer of long experience. In 1911 he was commissioned in the 17th Duke of York's Royal Canadian Hussars and after the war of 1914-18 commanded this regiment. Subsequently he commanded the 3rd Mounted Brigade and became President of the Canadian Cavalry Association.

The Second-in-Command and Director of Timber Operations was Colonel G. M. Strong, D.S.O., of Westmount, Quebec. He had served with General White during the last war and was well-known in the lumber industry in Canada. In June 1942 Colonel Strong returned to Canada and Colonel C. E. F. Jones (Montreal) took over his appointment. To-day there are three Assistant Directors of Timber Operations; Lieut.-Col. E. P. Burchett (Vancouver) is in charge of operations in the woods, Lieut.-Col. R. D. Roe (Vancouver) of milling and distribution and Lieut.-Col. A. E. Caldwell (Woodstock, New Brunswick) of workshops and transportation.

This combination of soldier and technician, typified by General White, is characteristic of the present Canadian Forestry Corps. Not only are the officers and men, for the most part, experienced lumbermen, they are also trained soldiers. The majority of the senior officers are either veterans of the last war or militia officers; while all other ranks are required to undergo two months basic military training in Canada. This training is con-

tinued on arrival overseas. General White has always laid considerable emphasis upon the combatant status of the troops under his command in contrast to the non-combatant position which they occupied during the last war. Five days a week the men fell, saw and transport timber, working nine hours a day. On Saturdays the Canadian woodsmen don battledress and web equipment, shoulder their rifles and engage in drill, musketry or tactical exercises. They are armed with modern infantry weapons and have clearly defined operational roles to play in the defence of Scotland in combination with the regular troops of Scottish Command and the local Home Guard companies. At a moment's notice they are prepared to metamorphose from their primary functions as foresters to their other and perhaps even more vital functions as soldiers. Although the danger of invasion is now remote, one may feel confident that against any parachutists or troops sent in a desperate gamble against Great Britain these tough fighting lumberjacks from Canada will give a good account of themselves.

Under the Corps Headquarters there are five administrative Forestry Districts,



A sergeant of the Canadian Forestry Corps measures pit props.

THE WORK OF THE CANADIAN FORESTRY CORPS BY THE ARTIST CAPTAIN

Top to bottom:—

"The Stick"—from a drawing

"Lopping Trees"—from a drawing

"The Jammer"—from a line and wash drawing

"Loading at the Skidway"—from a line and wash drawing

each commanded by a Lieutenant-Colonel. These Districts, which cover a wide area of the Scottish Highlands reaching almost from Loch Shin to the River Tay, are chosen upon a geographical basis and are not uniform in the number of companies which they contain. Although the Canadian Forestry Corps, as a whole, is under the technical direction of the Home Grown Timber Production Department of the Ministry of Supply, it remains under the control of General Montague as Senior Officer, Canadian Military Headquarters, London, for all military operational and administrative purposes.

Upon their arrival the Canadians at once set to work to erect their mills and quarters. The small portable Scottish mills did not meet with their approval, although each company now operates a "Scotch Bench" for the purpose of sawing mining timber. The mill equipment, selected and purchased in Canada, is the standard medium type rotary mill well-known throughout the Dominion. The mill machinery includes a 16-foot carriage, log haul-up, 5-inch three-saw edgers, rotary re-saw, spool stripper and trimmer table. The usual power unit is an International U.D. 18 100-horse-power Diesel engine, although in one or two instances steam power is used. The logging equipment includes tractors, sulkies and 2 and 3 drum winches for high lead logging. On the whole one may say that each forestry company is equipped on the basis of the most up-to-date methods of logging used in Eastern Canada, with a few special items from the West.

"The Skidway"—from a watercolour



Top to bottom:—

"Head Rig"—from a drawing

"Loading Lumber"—from a drawing

"The Saw Doctor"—from a wash drawing

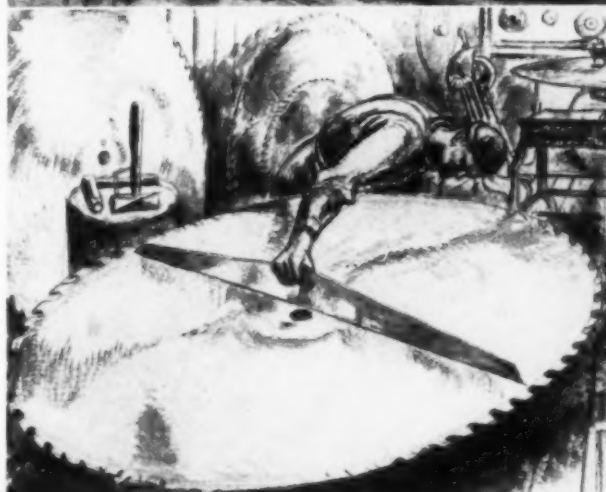
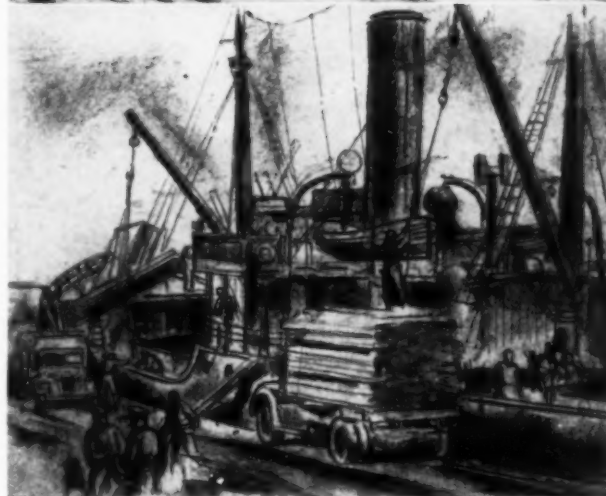
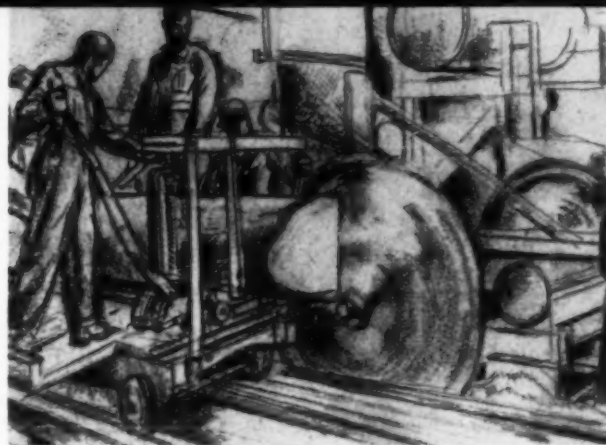
"Repairing a Sulky Tire"—from a line and wash drawing

If the lumbermen disliked the Scottish mills, they had every admiration for the Scottish forests. To the Canadian a forest presented a definite picture, a place of heavy woods choked with undergrowth and decaying windfalls; but in Scotland there was little virgin growth. Although the Highland clearances of Napoleonic times left many barren uplands, careful reforestation and conservation have always been a feature of British policy. The present-day forests are largely the result of careful planning. Underbrush and windfalls are periodically cleared away, leaving an impression upon the Canadian of a heavily wooded park.

The timber in which the Forestry Corps consists largely of Scotch pine, spruce and larch. In several of the camps Douglas fir and different types of hardwood have occasionally been harvested. Some of the timber milled has been upwards of 120 years of age, but, for the most part, it is of 60 to 70 years' growth.

The work begins with the requisitioning of the areas in which the companies are to carry out logging operations. This is the responsibility of the Home Grown Timber Production Department of the Ministry of Supply. In some instances, a company may be given *carte blanche* to clear out everything in sight; in others only certain trees are marked out for felling. The Scottish faller, anxious to make the most of the wood available, is accustomed to cut his tree close to the surface of the ground, and the Canadian, whether he likes it or not, is obliged to conform in this respect to

"Mill"—from a drawing





Her Majesty the Queen, accompanied by Brig.-Gen. White, passes along the ranks of the Canadian Forestry Corps during the Royal inspection.

Below:—7 September 1941—the Princesses Elizabeth and Margaret Rose at the saluting base with Brig.-Gen. White during a march past of the Canadian Forestry Corps at Balmoral Castle.



Scottish practice. Thus, even the areas which have been cleared present a clean appearance in comparison with the raw stump-studded clearings which mark the path of the logging crew in Canada.

The next task is to extract the fallen timber. This involves the use of tractors or "cats" as they are called, and large wheeled arches known as "sulkies". Both of these are being used for the first time in Scotland by the Canadians. The logs, trimmed of their branches, are attached to the sulky by means of a steel cable and then hauled or bucked to the loading skids, where they are sawn into log lengths for transportation to the mill. The ground traversed is often difficult, with stumps, boulders, streams and muddy quagmires. Over these the tractors and sulkies with their loads of four to six tons lurch and labour like tramp steamers bucking a heavy sea.



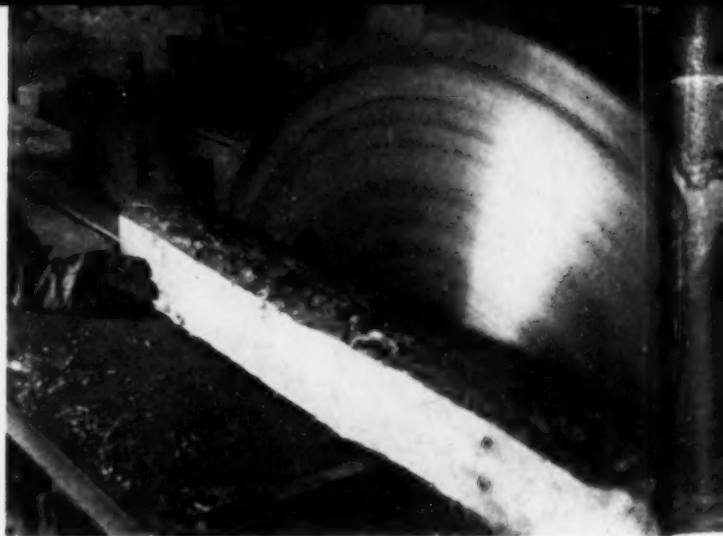
7 September 1941—His Majesty the King inspects details of the Canadian Forestry Corps at Balmoral Castle.

In those regions where the slopes are steep and precipitous, approximating mountain conditions, the British Columbia practice of high lead logging is used. This method, although familiar to the forestry companies from the Pacific Coast is not used either in Eastern Canada or in the British Isles where logging conditions rarely render it necessary. A strong tree is chosen, trimmed and topped by a man known as a "high-rigger". The tree is then braced with guy wires, and a drag line running from a tackle hitched to the top of this natural derrick and operated by a donkey engine or "yarder" hauls the felled timber up steep inclines to the place where it can be taken in tow by the cat and sully. The yarder is sometimes constructed on skids and is thus able to move under its own power either up or down the hills to carry on work in new locations as required.

The distances between the points where the bush gangs are at work and the mill operations are being carried on, vary with

the different companies. And the methods of transporting the logs differ accordingly. In some cases the logs are carried from ten to twenty miles by lorry; in others they are conveyed by narrow gauge Decauville railways. But in no instances are the Canadians permitted to run logs in the Scottish rivers. Each of these has its valuable salmon preserves which might be seriously injured in this way. The log drive and "burler" familiar to the Canadian lumber scene are thus entirely unknown in Scotland.

At the mill the logs are tipped into the mill pond or log wash. From here the washed logs are carried into the mill on the power ladder and then canted on the mechanical carriage which feeds them into the whirring headsaw. After the log has been sliced into planks these are put through the edger. Slab wood, on the other hand, is conveyed by a separate belt, and the better pieces are put through the rotary resaw. From the edger the planks pass to the trimmer saw and finally emerge



Sawing logs on a Scotch bench.

SCENES OF THE DAILY LIFE OF THE CAN



May 1941—members of a Canadian Forestry Corps marching through a Scottish village while carrying

Left, top to bottom:—Logs brought by Decauville railway to the mill.

7 October 1942—Canada's Defence Minister, Col. the Hon. J. L. Ralston, pays a visit to headquarters, Canadian Forestry Corps. With Col. Ralston in the front row are (left to right) Sir William Rootes, (British) Ministry of Supply; Brig.-Gen. J. B. White, Commanding C.F.C.; Maj.-Gen. the Hon. P. J. Montague, Senior Officer, C.M.H.Q., and Col. H. A. Dyde.

General view of a Canadian Forestry Corps camp in the Scottish Highlands.



Specimen of Scotch pine reputed to be 250 years old.



THE CANADIAN FORESTRY CORPS OVERSEAS



A Forestry Company from western Ontario march while carrying out military training.



Right, top to bottom:—A high rigger from British Columbia, sixty feet in the air, has just trimmed and topped an 80-year-old Scotch pine. Note the saw and axe hanging from his belt.

7 October 1942—the Minister of National Defence speaks to a group of fighting lumbermen during his visit to the C.F.C.

A typical sawmill constructed somewhere in Scotland by the Canadian Forestry Corps from lumber and slab wood produced by the Corps.





Left:—A Canadian forester from New Brunswick demonstrates his acrobatic achievements to his comrades.

Bottom:—Two French-Canadian lumbermen engaged in a friendly test of strength.



as sawn lumber termed "National Stock" to be used for a dozen different war purposes. Although the greater portion is piled for drying, much of it is shipped direct from the mills to different ports where, under Forestry Corps supervision, it is loaded on board waiting vessels.

Much, if not all, of this work had to be preceded by preliminary construction. Roads had to be built across moorland and up the sides of mountains; streams had to be bridged; mills and bunk houses had to be erected, before the primary task of felling, trimming and sawing trees could begin. In the winter, roads had to be

kept open, and Canadian snow ploughs, mounted on trucks and tractors, proved to be an indispensable item of equipment. The Forestry Corps have also assisted in other activities outside their normal duties as lumbermen and soldiers. They have been employed as fire fighters; given assistance to other Dominion forestry units; built a prisoner-of-war camp; cleared a large airfield in England required for the expanding needs of the R.C.A.F. component of the First Canadian Army; and, on one occasion, transported a large whaleboat in a manner reminiscent of the famous "Ship Railway" built across the isthmus of Chignecto.

The logging and milling methods of the Canadian Forestry Corps have excited the admiration of British forestry experts. From the time the tree is felled until the sawn lumber is stacked away on board ship, the whole process is, as far as possible, mechanized. No horses are used, little time is lost, and waste is at a positive minimum. Each company is, moreover, largely a self-contained unit. It operates its own bush gang and its own mill. It carries on its strength tradesmen of every kind necessary for the efficient carrying on of its allotted task: sawyers, millwrights, mechanics, lumberjacks, camp cooks, electricians, shoemakers, tailors, carpenters and so forth. It has its own armourer sergeant, its military instructors and its medical orderlies. It has its own garages and workshops. Each camp is planned on similar lines and provided with standardized equipment.

It is worth noting, however, that operations on different sites present different problems, and the visitor does not fail to note the display of initiative and resourcefulness on the part of individual company commanders. One from Ontario has constructed a small railway line; another from Quebec has contrived an ingenious method of conveying lumber from the mill to the lumber yard; a third from New Brunswick has made use of a neighbouring burn to develop a small hydro-power plant; while the high line is always the mark of the British Columbia logger.

The result has been a constant flow of lumber from the woodlands of Scotland to the "National Stock". The daily average

output of sawn lumber of each mill is approximately between 22,000 and 26,000 f.b.m., a real and tangible contribution to the Empire's war effort. At the same time pit wood, pit props, pulp wood, slab wood, telegraph poles and boat skins are all part of the production of each company. Sawdust disposal presents something of a problem in view of the absence of sawdust burners; and the shortage of motor lorries for hauling purposes has made it difficult to reduce the increasing quantities of slab wood available for fuel.

Official recognition of the work of General White in organizing the Canadian Forestry Corps and the achievement of the Corps in exploiting the British forests to the advantage of the United Nations came at the beginning of 1943 when General White's name appeared in the New Year's Honours List. On 2 February the Commander of the Canadian Forestry Corps was invested with the C.B.E. at Buckingham Palace.

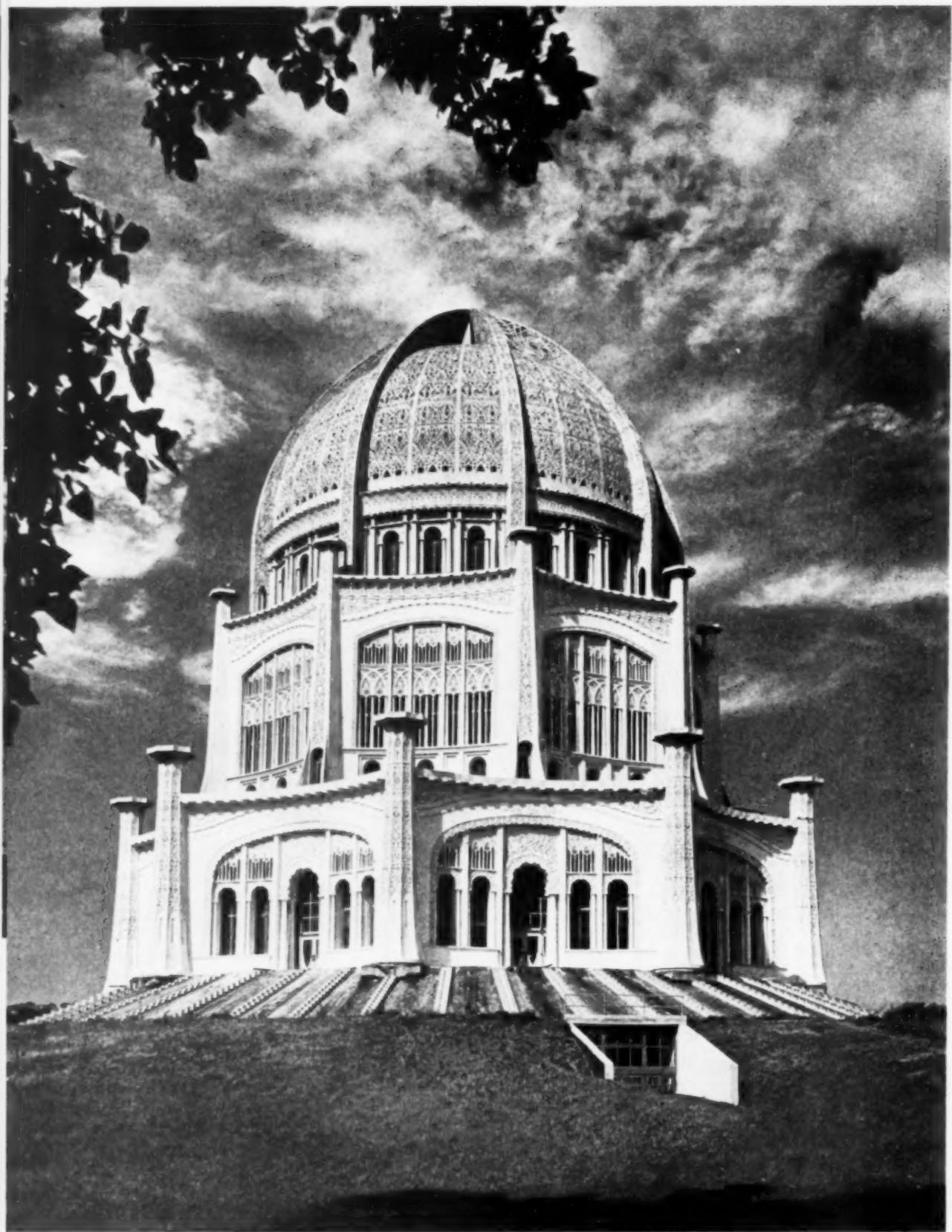
This was not the only mark of royal favour in the history of the Corps. On 7 September, 1941, Their Majesties King George VI and Queen Elizabeth carried out an inspection at Balmoral Castle, the Scottish home of the royal family, of elected units of the Canadian Forestry Corps. The scene was an historic one. Against a background of white granite and sombre green hills details from different forestry companies were drawn up in review order in the castle grounds. No longer were the Canadians lumbermen; they were soldiers of the King. Their Majesties moved up and down the ranks pausing occasionally to speak with the men and enquire about the parts of Canada from which they came. The inspection was brought to a conclusion with a march past at which His Majesty the King, dressed in the uniform of the Cameron Highlanders, took the salute. Following this ceremony, Their Majesties invited General White and his staff to attend divine service with them at Crathie Church and to lunch afterwards at Balmoral Castle.

During its stay in Scotland the Corps has been honoured with visits and inspections by many distinguished people including the Hon. J. L. Ralston, Minister of National Defence; Sir William Rootes, Chairman of the Supply Council and Executive, British Ministry of Supply; Lieut-General A. G. L. McNaughton, G.O.C.-in-C., First Canadian Army; Major-

General the Hon. P. J. Montague, Senior Officer, Canadian Military Headquarters; the Rt. Hon. Vincent Massey, High Commissioner for Canada in London, and others. In May, 1941, the year preceding the unfortunate accident which led to his death, H.R.H. the Duke of Kent paid a brief visit to Corps Headquarters and three of the companies operating in the same general area. At one of these companies a 21 gun salute, improvised by means of quarter sticks of dynamite in cans filled with sawdust, was fired in his honour.

The relations between the Canadian foresters and the Scottish population have always been most cordial. Not only does the scenery of the Highlands remind one in some places of the forest land of New Brunswick, in others of the Laurentians of Quebec, and in others of the foothills of the Rockies; but the people themselves resemble in many respects the people of Canada. There are many racial and family ties between them, and it is significant that on one village war memorial on Deeside seven out of twenty-three names inscribed thereon were those of men who had fallen in the Empire's service while fighting in Canadian units in the last war. The warm hospitality of the country is traditional and the welcome extended to the Canadians by the Scots has been reciprocated. Not only have there been many Scottish-Canadian weddings, but different members of the Corps have participated freely in various fêtes and local celebrations supplying money, music, entertainments and transportation.

Since the Canadian Forestry Corps first began its operations in 1941 there has been no let-up in the work of feeding the demand for lumber. Over 200,000,000 board feet have passed through the Canadian mills in Scotland. Bare patches are appearing in increasing numbers like great scars on the Highlands. Few people wish to see their hills and valleys stripped of trees, least of all the Scottish Highlanders; but sentiment must give way in time of strife, for wood is vital to the war effort, and valuable transatlantic cargo space had to be saved. With the U-boat menace coming under control the scene of operations may well be shifted back to this side of the Atlantic where a greater volume of output can be maintained. Meanwhile the work goes ruthlessly on; and the ring of the woodsman's axe, the chugg of the cat and the whine of the saw add their notes to the *Marche Militaire* of ultimate victory.



This unique Temple, the Baha'i House of Worship at Wilmette, Illinois, has been called "a lacy envelope enshrining the idea of Light". The ornamentation was completed in January 1943.

SYMBOLISM AND THE HUMANITIES

by SYLVIA KING

LIKE a jewel in a raised setting, or a vase presented on a pedestal, the Baha'i Temple now stands on the shores of Lake Michigan at Wilmette, Illinois, fully arrayed in a shining mantle of intricately carved ornamentation. In January, 1943, with the completion of the eighteen concentric steps, the goal of thirty years of building was attained.

The key-note of the symbolism of this unique, nine-sided Temple is suggested by the word "universal", for it is most accurately described by its name: "The Universal House of Worship". The symbolism of the "nine" is of nine great religions whose followers still exist; also in "nine" being the number which includes all other numbers.

The connection with the "humanities" is in the surrounding buildings to be erected to serve purposes of social welfare and education. According to the plan given by Baha'u'llah, the great Iranian prophet, in his writings some 70 years ago, these humanitarian institutions are to include a hospital, a home for the aged, a hospice for travellers, and a home for crippled children. In addition, a university for the study of the higher sciences will be included.

All the sides of this building are the same, both in the structural plan and in the ornamental design, and, in the future, nine equal avenues of approach through nine gardens will lead to each of the nine beautiful front doors.

The architect was the late Louis J. Bourgeois, a French-Canadian artist who was born at St. Gregoire (near Three Rivers) in the Province of Quebec. He presented his entire vision of the completed Temple in a hand-carved model so large that it filled the central space of an ordinary living-room. When this exquisite model was exhibited in New York City in 1919 Sherwin Cody wrote in the *New York Times*: "Americans will have to pause and study it long enough to find that an artist has wrought into this building the conception of a religious League of Nations".

Louis Bourgeois died in 1930 before the super-structure of the Temple was

completed, but he left the model and many detailed drawings to guide and inspire the builders. Now in 1943 the building stands complete in its outer ornamentation; a symbol of human solidarity.

The lower part of the building has been in use for the past ten years while the outer ornamentation was being completed, and the following utterances of Baha'u'llah now carved over the front entrances express the spirit of love and service which animated the founder and which now animates the world-wide community which bears His name:

"The earth is but one country and mankind its citizens."

"The best beloved of all things in My sight is Justice; turn not away therefrom if thou desirest Me."

"My love is My stronghold; he that entereth therein is safe and secure."

"Breathe not the sins of others so long as thou are thyself a sinner."

"Thy heart is My home; sanctify it for My descent."

"I have made death a messenger of joy to thee; wherefore dost thou grieve?"

"Make mention of Me on My earth that in My heaven I may remember thee."

"O rich ones on earth! The poor in your midst are My trust; guard ye My trust."

"The source of all learning is the knowledge of God, exalted be His glory."

Louis Bourgeois has himself described the source of his inspiration and the symbolism of the building in these words:

"The history of this Temple, as step by step it unfolds, is so unique that already the story will fill a book. Its inception was not from man for, as musicians, artists, poets, receive their inspiration from another realm, feel themselves to be receivers by whose means a heavenly melody is transmitted, a new idea given to the world, so the Temple's architect through all his years of labour was ever conscious that Baha'u'llah was the creator of this building to be erected to his glory. When the man-made creeds are stripped away from the religions we find nothing but harmony. To-day, however, religion is so entangled in the superstitions and hypotheses of men that it must needs be stated in a new form to be once again pure



One of the most beautiful designs has been developed for the doorway in each of the nine sides of the main story.

and undefiled. Likewise in architecture those fundamental structural lines which originated in the faith of all religions are the same, but so covered over are they with the decorations picturing creed upon creed and superstition upon superstition that we must needs lay them aside and create a new form of ornamentation.

"Into this new design then of the Temple is woven, in symbolic form, the great Baha'i teaching of unity — the unity of all religions and of all mankind. There are combinations of mathematical lines, symbolizing those of the universe, and in their intricate merging of circle into circle,

of circle within circle, we visualize the merging of all the religions into one."

A study of the detail in the tracery of the dome shows the graceful mingling of various symbolic forms. Here are crosses, circles, triangles, pyramids, and stars, and several varieties of each. One notes the Greek and Roman cross, also the ancient symbol of fire, water, earth, and air; again one notes the five-pointed star and Solomon's seal (the six-pointed star); the seven and eight-pointed stars; and, lastly, the magnificent nine-pointed star which today is the symbol of the essence of God. Over each door and window is a nine-pointed star and in the centre of each, in Arabic lettering, is a decorative treatment of the words "Ya Baha'u'l-Abha" (O Thou Glory of Glories).

A well known writer on art and symbolism, the late Mary Hanford Ford has written as follows of the architecture of the Temple:

"The lower story of the Baha'i Temple shows a marked deviation from past architectural forms. Each façade of the nine sections is an inverted half-circle. The doorway is in the centre and the sides are guarded by odd and beautiful columns. The architect said that these towers at the ends of the half-circle were like arms extended to welcome the passer-by. One is reminded in something of its aspect and ornamentation of the Moorish style, though analysis reveals no adherence to any type. One receives a suggestion of ancient Egypt in the columns, but no Egyptian temple has similar ones. The unique decoration around the doors has no ancestry anywhere.

"The second story is entirely different and very gay. Its style is rather distinctly Renaissance in some respects, and its graceful line of windows might be severe were it not unexpectedly capped by a cornice with tip-tilted ends, like the roof of a Chinese pagoda. Nothing could break more perfectly the law of tradition, and nothing could be more beautiful. A row of columns surrounds this story also entirely for ornamental effect.

"The third story is Romanesque in character and simple in decoration since it is the support of the great dome to whose beauty it is subordinated. This third story has also a terrace, above which rises the magnificent shining dome.

"The effect of the Temple as a whole is one of supreme grace and airy beauty.

It rises gradually into the splendour of the dome which is so fully a part of the structure that the whole lower portion seems ascending into it to find evolutionary completion in its beauty."

The building has true architectural harmony, the ground plan being in the form of a nonagon, or nine-pointed star. The dome is unique in having the ribs on the outside, and within there are no cross-members. Standing on the ground floor one looks up one hundred and sixty-one feet to the highest point of the dome — it is as though one were in a temple of light, for in the day-time direct sunlight enters through the lacy patterns of the dome and through the inner dome of glass which also serves as a protection against rain and snow.

Clara Edmunds-Hemingway has described the Temple in a sonnet entitled "Temple by the Lake":

"Baha'i Temple domed from gray to white,
Is tipped with folded wing, all angel-wise,
Symbolic of the peace of prayer that lies
In sanctuaries, be it day or night.
How intricately lovely to our sight,
Few things more exquisite beneath the skies —
A symphony to rest one's weary eyes
Or fill a heavy heart with quick delight.

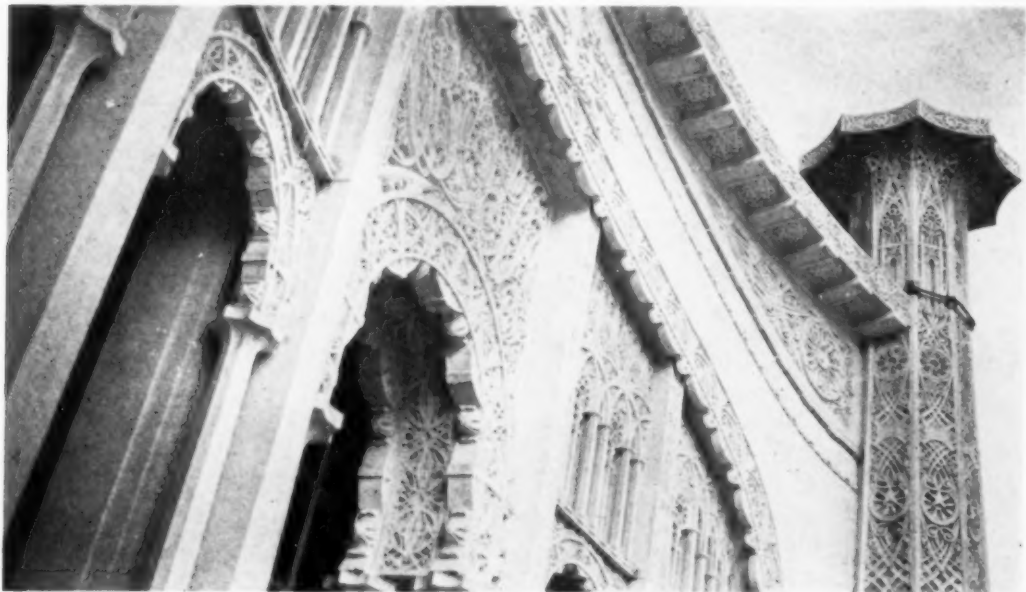
Nonagonal, its delicate design,
With infinite detail of wonder, shows,
Devotion from a people at a shrine.
Whatever one's belief, religion grows
When great harmonic beauty looms divine;
Then blessing from God's heaven overflows."

As to the material used in the structure of the Temple, this is a story in itself, but,

in brief, there are two varieties of quartz in the ornamental surface — one a clear crystal and crystalline and the other of somewhat darker and opalescent type. The crystalline quartz is reduced to sizes similar to eight-carat gem stones, while the opaque quartz is ground much finer. These two materials were then mixed to make Earley's concrete, a material lighter than stone, stronger than concrete and impervious to the elements. The crystalline quartz facing of the structure gives a sparkling effect either in direct sunlight or under artificial light.

As to the source of these materials, the crystal and crystalline quartz was obtained at King's Creek, Spartanburg, South Carolina, and the opalescent material from Moneta, Virginia. Approximately 743 tons of quartz were used to face the dome of the Temple and a similar additional amount to face the remainder of the lower sections. A report published in the *Mineralogist* magazine describes the Temple as being a gorgeous "gem stone", and the writer adds, "May the light of this brilliant architectural gem radiate to the darkest corners of the earth and instil an understanding in the hearts of all men . . ."

In the universal ideal of this Temple all racial and religious differences, all prejudices and bigotry are swept away, and the hearts are remoulded into spiritual realities which recognize only the brotherhood of man, the oneness of the world of humanity and the realization that all are children of one God.



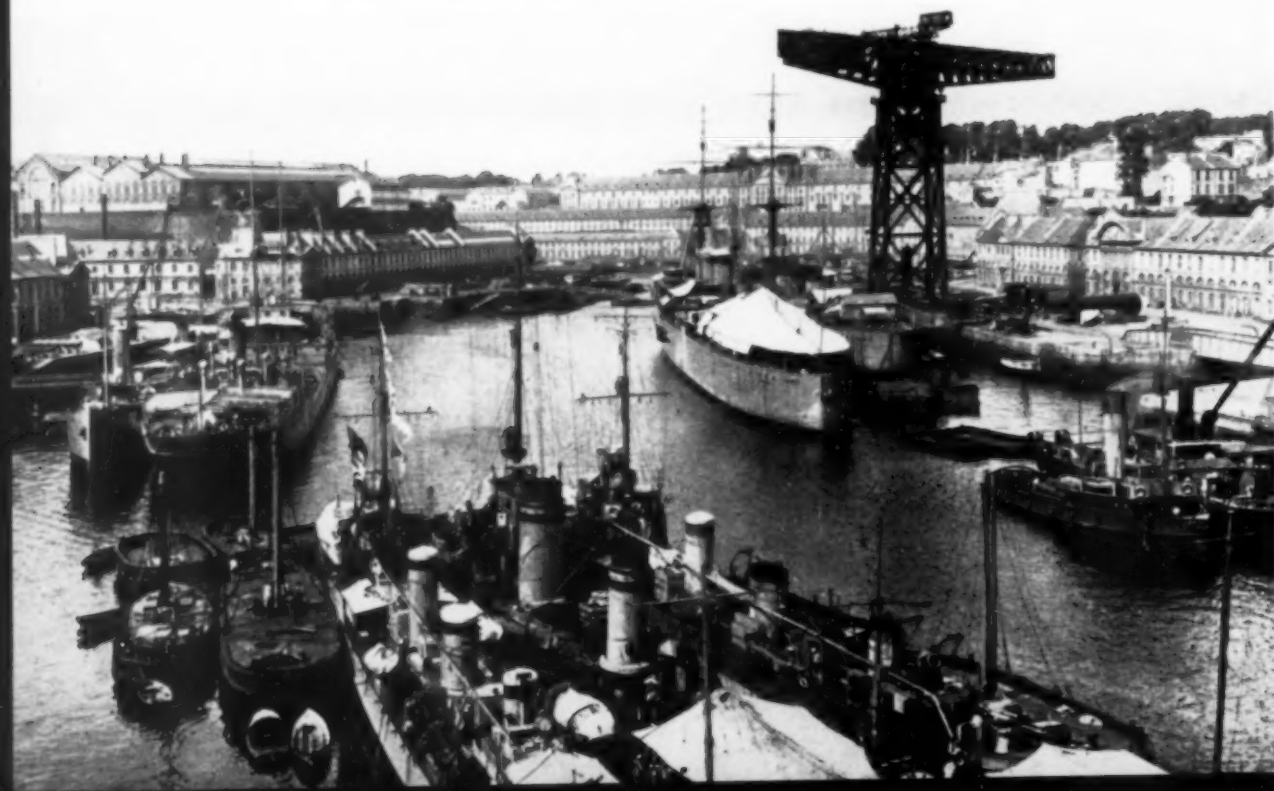
The symbol meaning "God the Most Glorious" appears in the centre of arch over each entrance door.



Boulogne harbour, France

Dorien Leigh photo

Brest naval harbour with its immense workshops and barracks





M.P.17 GERMANY-FRANCE. CALAIS-PRAGUE-ROSTOCK-AUGSBURG (CROWN COPYRIGHT)

ACROSS THE ENGLISH CHANNEL

by PETER MATTHEWS*

TO judge from the experience of the Allied landing on the toe of Italy at Salerno, an attack upon an enemy-held coastline falls into three stages: the first consists of the establishment of one or more initial beachheads; the second involves the deepening of that beachhead, or beachheads, to an extent sufficient to permit of the building-up of substantial forces, with their transport, dumps and all the ancillary services of a modern army. Only when this second stage has been passed is it possible to proceed to the third, namely the advance inland.

At Salerno, the second stage proved to be by far the most critical, for a large force, recently disembarked and congested within a constricted space, is peculiarly liable to the danger of successful counter-attack; the longer this phase lasts, the greater is the danger that the enemy, by drawing upon his reserves, will be able to reinforce the threatened area and drive the invading force back into the sea. At

Salerno, the Germans even went so far as to say that the process of throwing the Fifth Army back into the sea was well under way. Necessarily, then, any account of the Western Coast of Europe, obviously to be regarded as one among the possibles for the greater Allied invasion, must be written with these three successive stages in mind.

Germany's Defensive Hopes

German defensive plans are known to be based on the attempt to reinforce any point, or points, they regard as threatened, sufficiently rapidly to enable them to establish an overwhelming superiority. In an area already well supplied with roads, and with railways serving the various Channel ports, further extensions of the transport system have been taken in hand. Mechanized and motorized forces are held in reserve to be used when it becomes apparent which of a number of landings are likely to be on a serious scale, and

*Well-known British journalist and commentator on international affairs



St. Malo and S.S. Dinard, Brittany

which are merely feints or diversions. Since men and material can be moved more rapidly by road or rail than by sea, the Germans have always argued, in their propaganda, that they can count on establishing a decisive superiority at the decisive point or points.

The object of the coastal defences themselves is not so much to prevent landings altogether—this they can hardly hope to do—but to pin down the invading forces and thereby prolong the second phase, so that the defenders can build up a crushing superiority.

Clearly, then, a factor of primary importance will be the extent to which Germany's ability to reinforce can be neutralized by Allied air attack. For the Germans, the danger that their movement of reserves can be paralysed is obviously greatest in areas within the radius of operation of short-range fighter aircraft. Thus distance is a factor of first importance. In varying degrees, Allied forces, should they land at any point between the Hook of Holland and the Finisterre Peninsula, could be provided with fighter cover—just as they could in certain parts of the Mediterranean. From Harwich to the Hook of Holland is a distance of 104 miles; thereafter, the Channel narrows until, between Dover and Calais, it is no more than 21 miles wide; Dieppe is some 65 miles from Newhaven, and Le Hague, on the point of the Cherbourg Peninsula is 60 miles from Portland Bill, the nearest point on the British Coast. From Land's End to the nearest French territory is roughly 120 miles. But it would be necessary to provide fighter cover from British bases until airfields had been wrested from the enemy, brought into service, and rendered free of effective interference by enemy artillery. Thus, in practice, the

distance from coast to coast, or rather from the enemy coast to the nearest British airfields, is a minimum.

Where Air Support Would Be Strongest Of All

To say this is not to rule out attacks upon more distant stretches of enemy coastline. Short-range carrier-based aircraft might provide a substitute for land-based fighters, and the carriers might themselves be covered by shore-based fighters. Recently, the U.S.A.A.F. has been using fighters with a very long range. By a surprise attack on a more distant stretch of coastline, it might be possible to seize air bases, perhaps with the assistance of airborne forces. But, clearly, the most dangerous part of the coast, from the enemy's point of view, is the region between the Hook and Finisterre. At any point on this coastline, an invading force could receive air support on a far larger and more effective scale than was available at Salerno.

At the northeastern end of this section of the European "invasion coast"—by which is meant the coastline which is within reach of fighter cover from bases in Britain—the terrain presents certain formidable, but not necessarily insuperable, obstacles. All along the Dutch Coast, and to a somewhat lesser extent along the Belgian Coast, an invading army would have to land upon the soft sand of the Dunes, and heavy tanks, as well as lighter wheeled vehicles, might face difficulties in the sand. It is possible that this problem could be overcome in one way by the use of the portable "wire roads" which Allied engineers laid at Salerno, and again at Nettuno, but movement off these "roads" would be exceedingly difficult, if not impossible.

On this stretch of coastline, there is little cover, and, where the land is below sea-level, the enemy could make effective use of inundations. Furthermore, the beaches shelve very gradually, which means that shallow-draught landing craft would have to make relatively long journeys between the larger transports and the shore. The Germans are known to have exploited the dykes which abound along this stretch of coastline as defence works. On the other hand, if it proved possible to establish beachheads and to cross the obstacles of the Dunes, the terrain farther inland, with its abundance of roads, would be not unfavourable for an invading army when the first two phases of the attack had been successfully passed.

France's Parallel Rivers

Indeed, it is true of the whole of this particular "invasion coast" that, whilst the initial stages might well prove much more difficult and prolonged than at Salerno, the possibilities of exploiting a successful landing would be very much greater. For, at Salerno, the Germans dominated a narrow coastal plain from formidable hill and mountain positions: even when the initial landings had been made, the beachheads consolidated and the landing forces had won for themselves a certain freedom of movement, a whole series of natural obstacles hindered further rapid progress. A succession of rivers lay across the Allies' route of advance, and between these rivers formidable mountain barriers had to be crossed. In southern Italy, the Allied armies were compelled to master terrain comparable to that which faced the Red Army in its long drawn-out struggle for the Germans' Kuban bridgehead, and the rate of advance in the two operations was comparable.

In France, on the other hand, the terrain could be considerably more favourable to invaders when once the first critical stages of the landing had been passed. The main rivers, the Somme, the Seine and the Loire, flow roughly parallel to any probable line of advance and not across it, as in Italy.

Nettuno has shown the extent to which the movement of enemy reserves can be impeded by the force which controls the skies, and, though it would perhaps be over-optimistic to suppose a comparable degree of air mastery, General Montgomery has stated, in a recent interview, that it is one of his principles never to fight a land

battle until mastery of the air has first been won.

A picture of the obstacles to be overcome in any initial landing shows that. Just as, in land fighting, the minefields which are intended to prevent an attack by tanks are themselves covered by anti-tank artillery, so, in organizing their defences against a seaborne invasion, the Germans have laid minefields at sea around their "fortress", and have covered these minefields with coastal artillery. On shore, other minefields, both anti-personnel and anti-tank, are themselves covered by machine-gun nests and 88 mm anti-tank guns. When the attack on Dieppe was planned, it was considered necessary, as a precondition of success, to neutralize the batteries of 5.9 naval guns whose job it was to prevent an invasion armada from approaching the coast. In one instance this was done with complete success, in the other the fire of Commandos rendered the battery ineffective during the crucial period.

Sandbanks and Rocky Cliffs

A study of French coastal maps shows very considerable stretches of "rocky

Dinant Rocks, Belgium

Dorien Leigh photo



cliffs" and "chalk cliffs of a height of over twenty metres". Particularly at the mouths of rivers, where the cliffs are interrupted, there are frequent references to sandbanks, whilst, along the stretches of rocky cliff, "submerged rocks" are frequently shown.

Cliffs do not necessarily prevent successful landings by determined bodies of men, but it is obvious that, along the stretches of cliff, except where these are interrupted by river estuaries, the Germans will have to reckon only with forces armed with infantry weapons.

In many respects, the lessons of the Dieppe raid were encouraging. It proved possible for an Allied invasion fleet to lie off the enemy coast, in broad daylight, for a substantial period, and within range of German coastal batteries, without the transports and their escorting destroyers suffering serious damage from enemy attack. It proved possible to provide effective air cover for the landing troops and to establish an almost complete mastery of the air over the coastline and the waters off the coast. On the other hand, Dieppe proved the strength of the static German defences, and demonstrated the need for intensive air preparation and for the "softening up" of German shore defences. If surprise had been achieved, it might, in some measure, have offset the lack of bomber preparation, but surprise,

which had been achieved in the earlier attack on St. Nazaire, was forfeited owing to a chance encounter with German naval craft off the coast. Nettuno has proved that surprise is possible even when a large-scale landing is being effected.

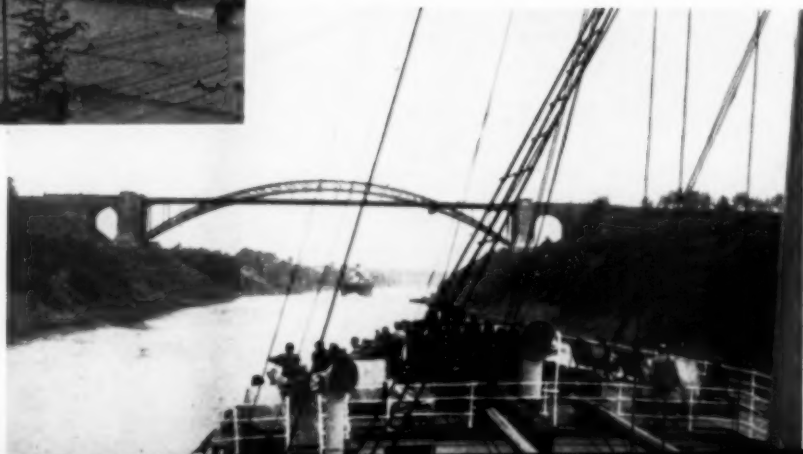
When the critical first stages of any new invasion had been successfully passed, the further development of the struggle would depend, in considerable measure, upon the reserves at the Germans' disposal. The strength of these reserves may well be affected everywhere by the Nettuno landing, which must have shown the Germans the danger of leaving unguarded important sectors of their south European coastline. In allocating their reserves, the enemy will have to take into account the possibility of new landings in the south, whether on the Italian, French or Balkan Coasts, and the need for guarding against these dangers will affect the balance of forces in the West. Furthermore, it remains to be seen what part the resistance movements in the German occupied countries will play in disrupting enemy communications and performing many of the tasks allotted to airborne troops wherever the major Allied blow falls. The "Fifth Column" which proved so invaluable to the Germans in their 1940 campaigns, may play an equally important part in the Allied offensive of 1944.



Antwerp harbour
—note Nazi ship in dock.

Dorien Leigh photo

One of the seven bridges
of the Kiel Canal



THE CANADIAN GEOGRAPHICAL SOCIETY ANNUAL GENERAL MEETING - 1944

The Fifteenth Annual General Meeting of The Canadian Geographical Society was held on February 15th in the Lecture Hall, National Museum of Canada, Ottawa, Dr. G. J. Desbarats, President, presiding.

Dr. Desbarats opened the business portion of the meeting with his Presidential Address. After welcoming those present, he went on to report that 1943 had been a most successful year for the Society. Further funds were allocated for the conduct of geographical research projects, and, in addition, a surplus was added to the working capital. Membership strength was growing steadily, and at the end of 1943 was recorded as 8,856, or 637 better than at the close of 1942.

The Society's documentary films, "The History of Power in Canada" and "Portage" were still in wide demand, reported Dr. Desbarats. "You will be interested to learn," he added, "that arrangements were completed in October of 1943 whereby the National Film Board, by special request, was to secure for educational use forty-one prints of our kodachrome sound film, "Portage", as follows: 28 prints in black and white (English), 7 prints in black and white (French), and 6 prints in full colour for the forces overseas. These prints are now in circulation".

The President then discussed briefly the role played by the Society's publications in the dissemination of geographical knowledge. In the course of 1943, approximately 144,000 copies of the *Journal* and over 109,000 copies of 7 reprints were published. During the year, the Society had been privileged to donate a further supply of over 10,000 *Journals* for the use of our Active Forces.

With regard to editorial policy, Dr. Desbarats reported that throughout 1943 the Society, in accordance with its practice of recording appropriately events of special Canadian significance, had continued to present, in addition to the regular geographical articles, a series of accounts (some thirteen) dealing with the development of Canada's war effort, particularly with regard to her Active Services.

"During the past year," he continued, "the prestige of the Society's official publication has been established more firmly and more widely to a most encouraging extent; that it has become a recognized medium, contributing to the development of Canada, is proved by documentary evidence received from readers throughout Canada and many other parts of the world. You will have noticed that several important articles dealing with reconstruction have been published in the *Journal* during the past year, and will be interested to learn that the Editorial Committee has planned a further series of significant and carefully selected accounts for 1944."

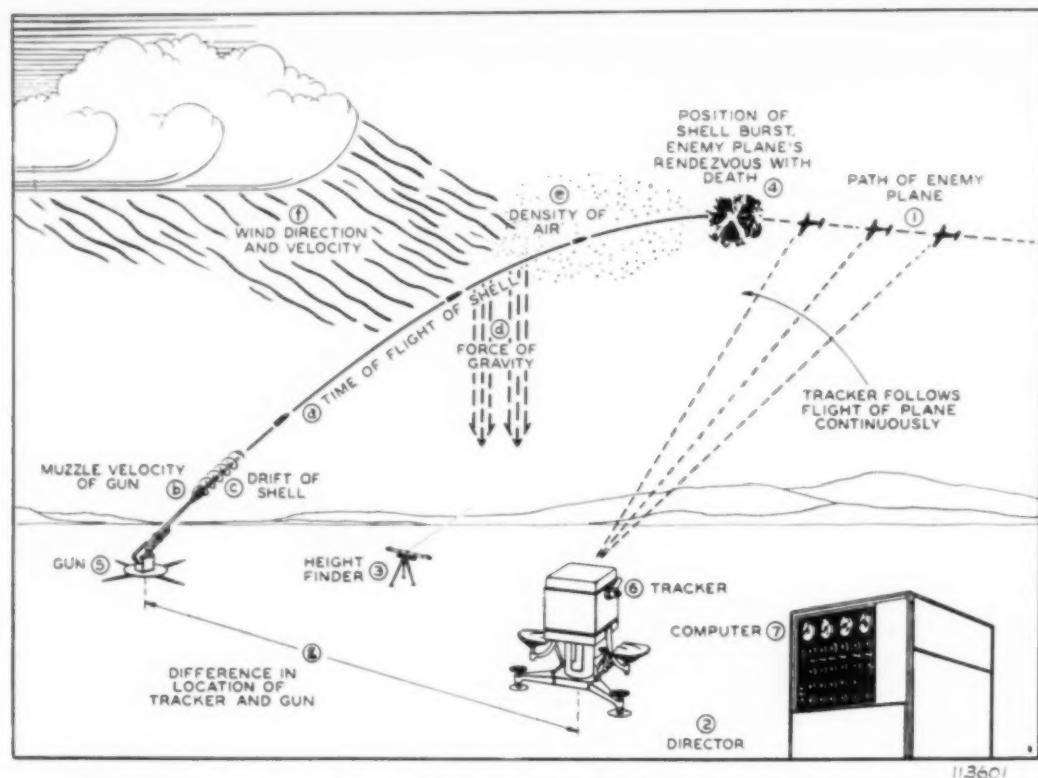
The President then expressed the deep regret felt by all Directors and Officers of the Society on the death of Hon. Dr. Duncan McArthur, Minister of Education for the Province of Ontario, who had been Director of the Society from its incorporation.

Dr. Desbarats voiced his appreciation of the time and attention devoted to Society affairs by his fellow Directors and the Chairmen and members of the various standing and special committees, and also thanked the Executive Secretary and Editor, Gordon Dallyn, and his staff and field representatives for their services during the year. In closing, the President stated that he would like to make special reference to the newspaper editors of Canada, who, in a year when space was at a premium for recording world news, generously provided valued editorial comments on various articles contained in the *Canadian Geographical Journal*.

Following the conclusion of the business portion of the Meeting, a most illuminating address on Yugoslavia was delivered by Hon. Dr. Izidor Cankar, Yugoslav Minister to Canada, and a Fellow of the Society. Dr. Cankar told the history of "the country of the South Slavs" from the sixth century, and gave an informative account of the geographical relationships, economic resources and varied climate of that valiant country which "will not stay conquered", illustrating his remarks by reference to coloured slides of large-scale maps. "Uncle Sam is too far from the Balkans, and Aunt Britain too busy with other nearer relations," declared Dr. Cankar during the course of his address. "If she does not want to be torn in pieces again by more powerful neighbours, Yugoslavia will have no choice but to go politically together with Russia, for no nation can escape geography in its foreign policy."

After Dr. Cankar had concluded his address, a beautiful kodachrome film depicting the life and scenery of Yugoslavia was shown. This was kindly lent to the Society for the occasion by His Grace, the Right Reverend Bishop Dionisije, of St. Sava Serbian Monastery, Libertyville, Illinois, and was accompanied by recordings of Yugoslav folk-songs, made available through the courtesy of Dr. Cankar.

The retiring eight Directors of the Society were re-elected to office for a further three-year term, and at the Board of Directors' Meeting held immediately after the General Meeting, the President and other Officers were re-elected, and the Editorial Committee of 1943 was re-appointed for 1944 (see Directors' page).



BELL TELEPHONE LABORATORIES, DEVELOPMENT REVOLUTIONIZES GUN-FIRE CONTROL

ELECTRICAL BRAIN DIRECTS AA FIRE

Hailed as one of the greatest developments ever made in the art of gun-fire control, the new electrical anti-aircraft gun director invented by Dr. David B. Parkinson, of Bell Telephone Laboratories, was made public recently.

Given the height of an aircraft and the path of its flight, the electrical computer instantly predicts where the gun is to be aimed and how the fuse of the shell is to be set so that the shell will burst right in the path of the aircraft.

The electrical brain makes allowance for the pull of gravity, density of the air, direction and velocity of the wind, and a number of other factors. It allows for the muzzle velocity of the gun, which varies according to the number of times the gun has been fired, and the temperature of the powder. It also notes the spin caused by the rifling of the gun.

It even compensates for errors introduced by the human element. Direction of the aircraft is noted by observers who must keep their telescopes trained upon the target. There is a tendency for these men to let the target stray from the cross-hairs in the telescopes. Realizing that this has occurred, the observer attempts a quick recovery which may be interpreted as a change in the speed of the aircraft. In the electrical brain, these momentary fluctuations are averaged out, and only a smooth rate of speed reported over a period of several seconds is considered.

Finally, it takes into account the difference in location between the tracker and the gun. Corrections for all of these factors must be made instantaneously.

In fact, it does everything but write to its victim's next-of-kin!

M9 differs from former directors, which employ mechanical movements, in using electrical circuits to make its calculations. The development of such a device was made possible by Bell Telephone Laboratories' research on electrical networks for telephone systems.

Idea for the director came to Dr. Parkinson, 29-year old physicist, in a dream. One night in the middle of 1940, while the Low Countries were being invaded, Dr. Parkinson awoke with the impression that he had been a member of an anti-aircraft gun crew which was bringing down an aircraft with every shot because it was equipped with an electronic device. He recalled that the device resembled the speech volume apparatus upon which he was working at the Laboratories. He and his associates took up the problem, and, a week before Pearl Harbour, a model had been delivered to the Army for test.

In the hands of skilled instrument makers, the model was translated into designs which could meet field requirements of small size, accessibility, and ruggedness, and which could be built with high accuracy by ordinary shop personnel and production methods. Five thousand detailed drawings and 1,100 specifications were required to build its 3,300 different parts.

In the last war, ack-ack batteries required 17,000 rounds just to hit one aircraft. Equipped only with mechanical directors, 90 millimetre guns in the South Pacific are now knocking down one aircraft with an average of only 90 shots. On one occasion, 12 out of 16 Jap bombers were actually shot down from an altitude of 14,600 feet with 88 shots.

Now rolling off the production lines, the new M9's should do even better than that!

EDITOR'S NOTE-BOOK

S. C. Ells, B.A., B.Sc., F.R.G.S., F.G.S., has been associated with engineering and with geological exploration in Northern Canada for many years. Prior to 1912, he served as locating engineer, maintenance engineer and grade revision engineer on various railway projects, and selected and charted the tide-water terminal for the T. & N. O. Railway on James Bay. He had also reported on oil shales in Eastern and Western Canada, and for many years was in charge of exploration of the bituminous sands of Alberta (see "Research Touches the North", C. G. J., XXIV, 256). Mr. Ells has had extensive experience in connection with road and airport construction. His work in northern British Columbia and southern Yukon has given him an insight into problems presented by the construction of the Alaska Highway.

Donald W. Buchanan, author, journalist and art critic is already well-known to readers of the Journal (see "Mormons in Canada", II, 255; "Waterton Lakes Park", VI, 69; "Canada and the University City", X, 81; "The Story of Canadian Art", XVII, 273; "Canada on the World's Screen", XXII, 70; "Defence Outpost for North America", XXIII, 106). A graduate of the University of Toronto (B. A. in Modern History), he was awarded the Wilder Fellowship, and continued his studies at Oxford University, England. Mr. Buchanan is at present Supervisor of Circuits for the National Film Board of Canada. Previously he promoted the establishment of the National Film Society of Canada, and before his appointment to the Film Board was Director of Talks for the Canadian Broadcasting Corporation.

Sylvia King, contributor of the article entitled "Symbolism and the Humanities" with illustrations of the newly completed Baha'i Temple at Wilmette, Illinois, is a young American writer and lecturer who has travelled widely through Europe and the United States doing volunteer work as a lecturer for the Baha'i faith and in the Racial Amity work. During a recent visit to Canada, she arranged and presented a series of radio programmes on the Baha'i teachings on "World Reconstruction".

G. F. G. Stanley, who contributes "The Canadian Forestry Corps, 1940-1943", is Assistant Historical Officer at Canadian Military Headquarters, London. Major Stanley graduated from the University of Alberta in 1929, was appointed a Rhodes Scholar, and for the next few years studied at Oxford, where he took the degree of D. Phil. in 1935. In the following year he joined the staff of Mount Allison University, where he subsequently became Professor of History. He is the author of *The Birth of Western Canada* (London, 1936), the standard work on the two Riel Rebellions. Major Stanley had been a member of the Canadian Officers' Training Corps while at the University of Alberta, and in 1938 was commissioned in the New Brunswick Rangers, being called out for active duty on August 26, 1939. He returned to Mount Allison for a short time thereafter, but has been on active service continuously since September, 1940, and has held his present appointment in London since October, 1942.

AMONGST THE NEW BOOKS

Alpine Ways by F. S. SMYTHE, (Adam and Charles Black, London—The MacMillan Co., Toronto, \$5.00). Forty-seven photogravure reproductions of Alpine photographs with a brief introductory essay and descriptive notes. This is the latest of several similar books by Mr. Smythe whose own delight in mountain scenery and mountain climbing is reflected in the beauty of his photographs. His handling of snow scenes is particularly effective even to us in Canada who are no strangers to the glories of the winter landscapes. This book is a pleasant and restful interlude from the iron clangours of war, and, it is to be hoped, a foretaste of a not distant day when the beauties of the world around us may again be enjoyed in freedom of mind.

P. E. P.

An Introduction to Weather and Climate (Second Edition) by GLEN T. TREWARTH. The McGraw-Hill Book Company, N.Y. \$4.00.

A text book for college use by one of America's leading geographers, which is perhaps a little too much of the text book to appeal to the casual reader, but which the weather-minded will find well worth a careful study. It is illustrated with nearly two hundred diagrams and photographs, and seven large plates. There is an index and exhaustive bibliographies are appended to each chapter.

P. E. P.



The Strength of Alcoholic Beverages

During the past several months, a number of misleading statements have been circulated regarding the strength of alcoholic beverages sold under the new Federal regulations. The following facts will no doubt help to clear up a greatly exaggerated situation.

Before the new regulations concerning strength were imposed, the alcoholic strength of beverages sold in this province such as Scotch whisky, rye whisky, gin, Cognac and brandy, was approximately 42.8 per cent alcohol by volume, corresponding to 75 degrees proof (British Proof Spirit) or its equivalent—25 degrees underproof (25 U.P.)

That was the situation before the new regulations of November, 1942 were applied. This new wartime law specified that all alcoholic beverages which were to be bottled and placed on the market were not to be stronger than 30 degrees underproof (30 U.P.)—that is, 70 degrees proof or its equivalent, 40 per cent alcohol by volume. **Thus it can be seen that most of our alcoholic beverages had their alcoholic**

strength reduced from 42.8 per cent alcohol to 40 per cent alcohol.

From these facts it is easily realized that alcoholic beverages in general have not been greatly altered. And it is interesting to note in passing that in Great Britain, most of the alcoholic beverages offered for sale are no stronger than 30 degrees underproof. (30 U.P.) Scottish distillers and all others who engage themselves in this business would be surprised indeed, if told that this particular alcoholic strength indicated an adulteration of their products. A number of these same overseas products are also offered for sale at a strength of 40 degrees underproof (40 U.P.) which corresponds to 60 degrees proof or its equivalent, 34.3 per cent alcohol by volume.

The Quebec Liquor Commission publishes this information in the hope that the public will reply to those who see fit to pretend that all alcoholic beverages sold in Quebec to-day are adulterated heavily. It also takes this occasion to point out to the public that it is in no way responsible for the present situation which was brought about by regulations imposed by Federal authorities. The situation in Quebec is exactly the same as that existing in every other province of the Dominion where alcoholic beverages are sold.

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